A STUDY OF EFFICACY OF TRANEXEMIC ACID IN REDUCING CESAREAN SECTION BLOOD LOSS

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CERTIFICATE

This is to certify that this dissertation entitled **"A STUDY OF EFFICACY OF TRANEXEMIC ACID IN REDUCING CESAREAN SECTION BLOOD LOSS"** submitted by **Dr.D.Punitha Meenakshi**, appearing for **M.S. (Obstetrics and Gynaecology)** degree examination in April 2015 is a original bonafide record of work done from November 2013 to August 2014 by her under my guidance and supervision in partial fulfillment of requirement of the Tamil Nadu Dr.M.G.R. Medical University, Chennai. I forward this to the Tamil Nadu Dr.M.G.R. Medical University, Chennai, Tamil Nadu, India.

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DECLARATION

I, **Dr. D. PUNITHA MEENAKSHI**, solemnly declare that this dissertation **"A STUDY OF EFFICACY OF TRANEXEMIC ACID IN REDUCING CESAREAN SECTION BLOOD LOSS"** was done by me at the Department of Obstetrics and Gynaecology, Chengalpattu Medical College, Chengalpattu under the guidance and supervision of the Professor of Obstetrics and Gynaecology, Chengalpattu Medical College, Chengalpattu, between 2013 and 2014.

This dissertation is submitted to the Tamil Nadu Dr.M.G.R. Medical University, Chennai-600032 in partial fulfillment of the University requirements for the award of the degree of M.S., Obstetrics and Gynaecology.

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Date : **(D.PUNITHA MEENAKSHI)**

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ABBREVIATIONS USED

USG	–	Ultrasonogram
LSCS	–	Lower Segment Cesarean Section
TXA	-	Tranexemic Acid
MDG	-	Millenium Development Goal
BMI	-	Body Mass Index
PIH	-	Pregnancy Induced Hypertension
PPH	-	Post Partum Hemorrhage
BP	-	Blood Pressure
PR	-	Pulse Rate
RR	-	Respiratory Rate
Hb	-	Hemoglobin
PT	-	Prothrombin Time
aPTT	-	Activated Partial Thromboplastin Time
QBL	-	Quantification of Blood Loss
DIC	-	Disseminated Intravascular Coagulation
IUD	-	Intra Uterine Death
WHO	-	World Health Organization
ACOG	-	American College of Obstetrics & Gynaecology
RCOG	-	Royal College of Obstetrics & Gynaecology
BMI	-	Body Mass Index
AMTSL	-	Active Management of Third Stage of Labour
POD	-	Post Operative Day

PD	-	Placental Delivery
EOS	-	End of Surgery
PP	-	Post Partum
NICU	-	Neonatal Intensive Care Unit
HMD	-	Hyaline Membrane disease
TTN	-	Transient Tachypnea of Newborn
HIE	-	Hypoxic Ischemic Encephalopathy
DVT	-	Deep Vein Thrombosis
MMR	-	Maternal Mortality Rate
RBC	-	Red Blood Corpuscles
PL	-	Previous LSCS
PROM	-	Premature Rupture of Membrane
FD	-	Fetal Distress
FI	-	Failed Induction
CPD	-	Cephalo Pelvic Disproportion
GHD	-	Gestational Hypertension
FDP	-	Fibrin degradation Products

INTRODUCTION

Caesarean section(CS) is found to be one of the most commonly performed abdominal surgery on women in most part of the world. CS was performed by Bennett in 1794 on his wife Elizabeth and first modern CS was performed by a German Dr. Ferdinand Adolf Kehrer[1]

Though WHO had at one point of time, in 1982[2] stated that "there is no justification for any region to have more than 15%" caesarean section rate, they subsequently withdrew their statement in 2010. There is no empirical evidence for an optimum percentage. What matters most is that women who need CS should receive it.

In recent years the CS rate is on increasing trend in both developed countries and developing countries. It has increased in USA from being 20 % in 1996 to 33 % in 2011.

The Cesarean percentage is 46 % in China and 40 % in Italy. Similar trends have also been documented in low income countries, particularly in Latin America and some countries in Asia[3].

Delivery by CS when compared to vaginal delivery has more complications both to mother and baby and the most important one is primary and secondary post partum hemorrhage. This may result in increased maternal mortality and morbidity.

Today even though the CS is safer with improved surgical and anesthetic techniques but it still remains the major cause of intra operational and post operational complications – hemorrhage, infection, and prolonged hospital stay than normal vaginal delivery[4]

PPH accounts for about 35% global maternal death. The **MDG**[5] Goal to improve Maternal health targets to decrease maternal mortality by 75% by 2015. Every year 3.5 to 5 lakhs females die from pregnancy related causes and 15 to 20 million females suffer morbidity attributed to pregnancy.

Cesarean delivery when compared to vaginal delivery is more traumatic because of tissue injury but is more preferred over vaginal delivery in needed situation to reduce the maternal and child mortality and morbidity. Hence there must be an appropriate balance between the coagulation cascade system that provide clot formation and fibrinolytic system that dissolves the clot[6] .

Blood loss in CS about double than that lost in vaginal delivery. During placental delivery there will be activation of fibrinolytic system and last for 6 to 10 hrs thus resulting in Post Partum Hemorrhage. As a result it is important to reduce the bleeding in cesarean section both intra operatively and post operatively so as to reduce maternal mortality.

Excessive bleeding will make the need for transfusion of blood products which make the prone to risk of transfusion related

complications and adverse reactions ranging from mild febrile illness to life threatening hemolytic reactions – TRALI (transfusion associated lung injury).[7]

In taking into account of safety and cost effectiveness in respect to blood bank operation and its shortage have made us to take effort to reduce transfusion requiring during CS surgery.

As the fibrinolytic system is being activated from the time of placental delivery an anti fibrinolytic agent – TRANEXEMIC ACID will be effective in controlling the blood loss during CS. As its anti fibrinolytic activity lasts for 6 – 10 hrs it can also control post partum blood loss too.

In our study, the efficacy of Tranexemic Acid has been investigated in reducing blood loss during and after cesarean section.

AIMS OF THE STUDY

1. To find whether tranexamic acid is effective in reducing peroperative and postoperative blood loss in lower segment caesaerean section
2. To find whether tranexamic acid is associated with any adverse reactions or complications

OBJECTIVES OF THE STUDY

1. To study the effect of Intravenous infusion of Tranexemic Acid, starting from 15 minutes prior to Skin Incision at the dose of 15 mg/Kg Body Weight, in study group and compare this with a control group of same number who did not receive this drug
2. To study the following parameters in both groups to make sure that the randomization has been proper and both groups are comparable
    a. (I) Age
    b. (II) Body Mass Index (BMI) which is calculated by measuring
        i. Weight
        ii. Height
    c. (III) Parity
    d. (IV) Indication for Cesarean Section
    e. (V) Duration of Cesarean Section
    f. (VI) Birth weight of Baby
3. To study the following parameters in both groups and find whether there is any change in

a. Pre Op and Post Op Vital Parameters between the Study Group and Control Group which is assessed by comparing

    i. (VII) Pulse

    ii. (VIII) Systolic BP

    iii. (IX) Diastolic BP

    iv. (X) Respiratory Rate

b. Blood Loss between the Study Group and Control Group which is assessed by comparing

    i. (XI) Blood Loss during and following Cesarean Section which is the sum of Per Operative Blood Loss (from the time of Placental Delivery to End of Surgery) and Post Operative Blood Loss (from End of Surgery to 2 hours Post Partum)

    ii. (XII) Fall in Hb % by comparing Hb % on Admission and Hb % on 3rd Post Op Day

c. Complications of Cesarean Section between the Study Group and Control Group which is assessed by comparing

    i. (XIII) Incidence of PPH

ii. (XIV) Need of Maternal Need of Maternal Blood Transfusion

iii. (XV) Use of Additional Uterotonics

iv. (XVI) Prolonged Hospital Stay

d. Neonatal Outcome between the Study Group and Control Group which is assessed by comparing

i. (XVII) APGAR

ii. (XVIII) Admission Rate in NICU

4. To find whether there are any Adverse Effects of Drug which is studied by comparing the incidence of following between the Study Group and Control Group

i. (XIX) Nausea

ii. (XX) Vomiting

iii. (XXI) Diarrhea

iv. (XXII) Thrombosis

REVIEW OF LITERATURE

Obstetric hemorrhage is the leading cause of maternal death worldwide. Approximately one maternal death due to postpartum haemorrage occurs in every 7 minutes. PPH is a preventable factor. During placental delivery there will be activation of fibrinolytic system . This fibrinolytic activation will last upto 6 to 10 hours resulting in PPH.

Tranexamic acid ,an antifibrinolytic drug exerts its antifibrinolytic activity by blocking the lysine binding sites of plasminogen & the plasmin molecules,thereby preventing binding of plasminogen and plasmin to the fibrin substrate.Also tranexamic acid inhibits plasminogen activators so that inhibiting the conversion of plasminogen to plasmin.

cesarean delivery when compared to vaginal delivery is more traumatic and also mortality and morbidity in caesarean delivery is higher compared to vaginal delivery.

A study conducted in india in 2010 (Mukerji et al) [8]an analytical observational study on maternal mortality and caesarean section reported that there is 3 fold risk of maternal death after caesarean section when compared to vaginal delivery.

In another study by Bruinse et al[9] , Gurbuz B et al [10]reported that emergency peripartum hysterectomy is about 5 to 10 times after caesarean section than vaginal delivery.

Taking all this into account and since prevention is better than cure we decided to use Tranexamic acid in our trial.

COAGULATION AND FIBRINOLYTIC CASCADE

Haemostasis is an appropriate balance between coagulation cascade and fibrinolytic system that produces fibrin clot and dissolution of the fibrin clots respectively.

When there is any tissue injury there will be activation of coagulation system in which the primary response will be the platelet plug formation by the activation and aggregation of platelets. The second response will be formation of thrombin, which in turn cleaves the fibrinogen into fibrin monomers. They polymerise to form insoluble fibrin thus forming a haemostatic seal on damaged blood vessel wall[11]

By the deposition of fibrin the fibrinolytic system gets activated and helps in keeping the vessel lumen open. When the plasminogen gets trapped within the clot it binds with lysine residues on the surface of fibrin and it gets converted into active plasmin by an activator released from the endothelial cells known as tissue plasminogen activator t-PA.

Thus the activated plasmin degrades the fibrin into large fragments, these fragments are further degraded into fibrin degradation products (FDP) and are removed in the circulation.

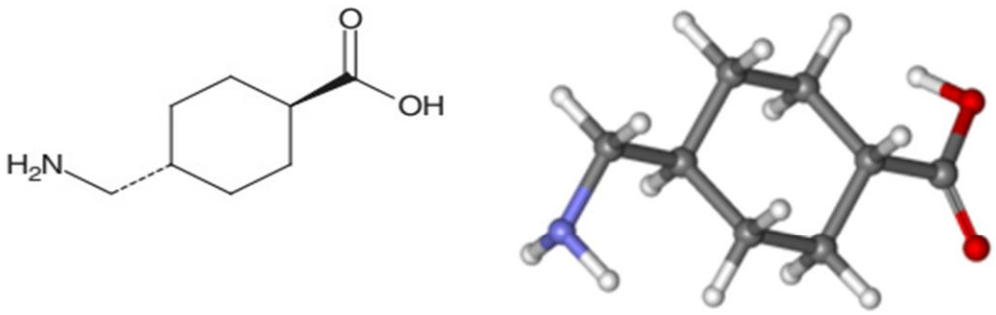
Hyperfibrinolysis is found to be associated with inflammatory and allergic states since the inflammatory and fibrinolytic systems are inter related in the generation of proinflammatory cytokines. But fibrinolysis is naturally regulated by plasminogen activator inhibitors (PAI-1) and plasmin inhibitor(α2 antiplasmin)

Hyperfibrinolysis which due to rapid dissolution of haemostatic fibrin results in recurrent and excessive bleeding that can be prevented by antifibrinolytic drugs which stabilize the fibrin clots by blocking the action of plasmin.

Available antifibrinolytic agents are tranexamic acid and EACA (ε-aminocaproic acid) and apoprotin. Apoprotin antifibrinolytic agent which acts by inhibiting serine proteases was found to be associated with high mortality in the BART study and hence withdrawn from the market.

TRANEXAMIC ACID is a synthetic analog of the amino acid lysine. The empirical formula is C8H15NO2 and Systematic (IUPAC) name is trans-4H-aminomethylcyclohexanecarboxylic acid. The molecular weight is 157.2. pKa is 4.3 and 10.6. The chemical structure is

Fig :1 Chemical Sructure of Tranexamic ACID



It is a white odorless crystalline powder which is freely soluble in water, glacial acetic acid but insoluble in ethanol and acetone. Aqueous solution for injection has a pH of 6.5-8

PHARMACODYNAMIC PROPERTIES

Antifibrinolytic property of tranexamic acid is through:

1. Reversible, competitive binding to one lysine binding sites on plasminogen with high affinity and four other sites with low affinity, so that it can no longer bind with plasminogen activator.

2. Non competitive blocking of α2 antiplasmin.inhibition of proteolytic action of plasmin by blocking the binding of α2 antiplasmin.

3. Both tranexamic acids and EACA interact with low affinity lysine binding site of kringle 5 domain, but when compared to EACA,

tranexamic acid has 6-10 times more binding potency to plasminogen[12].

4. At blood concentration <10 mg/ml the TXA has no effect on blood coagulation parameters (i.e platelet count, prothrombin time,aPTT)

5. At concentration of 1mg/ml it does not aggregate the platelets in vitro.However at concentration of 10 mg/ml it prolongs the thrombin time.

The antifibrinolytic property of TXA is reflected by reduced concentration of D-dimer , breakdown product of cross linked fibrin in blood.

Fig:2 Coagulation Cascade & TXA

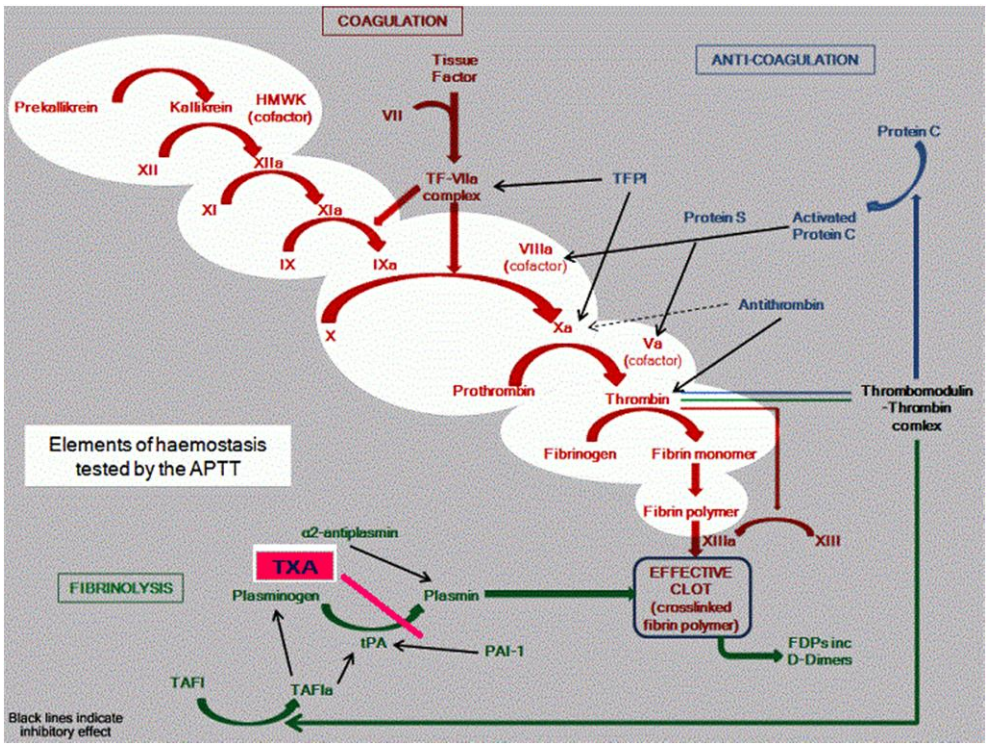
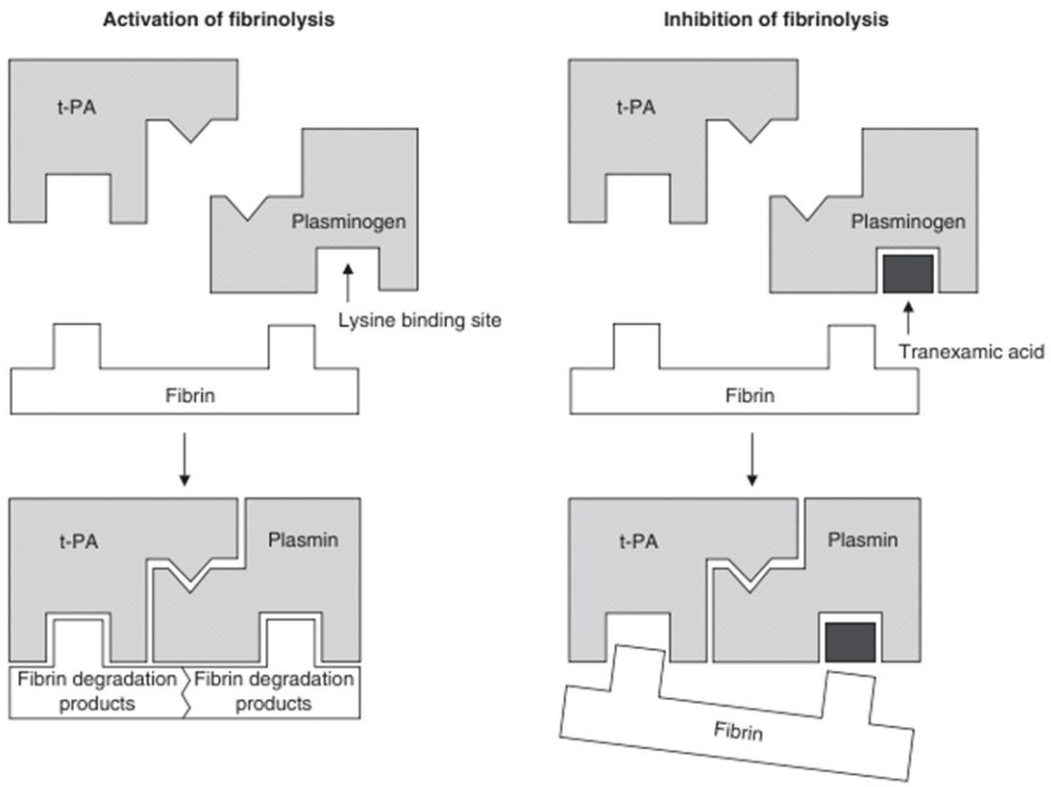


Fig: 3 Shows Mechanism of Action of TXA



PHARMACOKINETIC PROPERTIES[13]

Its ideal dosage regimen for each indication is not well defined and varied widely. It can be given through oral, parentral or topical route. The effective therapeutic concentration of TXA for inhibiting fibrinolysis reported by various studies is 5-10mg/l or 10-15 mg /l

- Oral administration is not interfered by food. Maximum plasma concentration obtained at 2-3 hours .Bioavailability of oral TXA is 30-40%

- Intravenous administration of TXA with 1g dose –plasma concentration >10mg/l will be achieved and lasts for 5-6 hours

- Only 3% of TXA bound to plasma proteins and is almost fully accounted by binding with plasminogen.it is not bound to albumin

- Volume of distribution of TXA is about 0.39l/kg. Maximum tissue distribution seen in liver,kidney,lungs.

- It diffuse rapidly into joint fluid and synovial membranes

- It can cross blood brain barrier and penetrates the eye with aqueous humour concentration about $1/10^{th}$ of plasma concentration.

- It can cross the placenta and cord blood concentration is similar to maternal concentration.

- The concentration in breast milk is about 1% of the serum concentration, so the excretion through breast milk is low

- 95% of drug excreted unchanged in urine.

  Following IV administration of 10mg/kg , 30% recovered unchanged in urine in one hour and 90% by 24 hours via glomerular filtration. Overall renal clearance is equal to plasma clearance (110-116 ml/min) [14]

PHARMACOECONOMICS

The cost effectiveness of tranexamic acid has been studied and estimated in two modeled analyses.one is Markhov model [15]and the other was assessing the use of TXA over patients in surgical

bleeding in 4 African countries with HIV prevalence and blood transfusion. Markhov model -a model over a lifetime horizon was used and estimated the cost effectiveness i.e. the incremental cost per life year gained of TXA use in trauma patients with significant hemorrhage. The datas were collected from CRASH – 2 trial .They compare the results for low (Tanzania), middle (India) and high (UK) income country.

Monte Carlo simulations and probabilistic sensitivity analyses were performed. They predicted that TXA would be cost effective in all these income countries with incremental cost per life year saved of I$48Tanzania, I$66 for India and I$64 for the UK.

METABOLISM

- Only small fraction of the drug is metabolized.
- Routes of biotransformation are acetylation or deamination followed by oxidation or reduction.

DRUG INTERACTIONS[13]

- With factor IX- concomitant administration is to be avoided as there is increased risk of thrombosis.
- With tretinoin – in acute promyelocytic leukemic patients , procoagulant effect of tretinoin will be exacerbated and cause thrombotic events

- Not to be used along with combined hormonal contraceptives to avoid thrombosis
- It causes cerebral vasospasm when combined with chlorpromazine

PREPARATIONS, DOSAGE AND ADMINISTRATION[14]

- Oral tablets -500 mg , 15- 25mg/kg –twice /thrice daily for a period of one week. Dose to be reduced in elderly patients due to reduced physiological functions
- Intravenous
    - Available preparations with 100mg/ml (5ml and 10ml ampoules)
    - Loading Dose -10mg/kg either direct slow IV or by infusion after diluting with 20ml of 5%dextrose at a rate not more than 1ml/min.
    - Maintenance dose: 1mg/kg/hour IV infusion
- oral mucosa and saliva are rich in plasminogen activator. Hence Mouth washes containing tranexamic acid are also available and used for hemophilia patients before and after dental extraction.

DOSE ADJUSTMENT

As it is excreted through glomerular filtration, dose should be adjusted according to creatinine clearance[14],

creatinine clearance 50-80 ml/min- 50% of total dose

10-50ml/min – 25% of total dose

< 10 ml/min – 10% of total dose.

DRUG STORAGE

- Tablets storage- below 30 ºc
- Injections should be stored at room temperature in a cool, dry place and should be kept away from heat or sunlight. Do not be freezed

INDICATIONS

As an anti fibrinolytic agent, therapeutically it can be used in all types of bleeding as a prophylactic agent it can also be administered prior to surgical procedures where we expect excess bleeding.

- Obstetric causes : ante partum hemorrhage, Postpartum hemorrhaged, Caeserean section,DIC
- Gynaecological causes- AUB,conization of cervix, myomectomy.
- Thrombasthenia related bleeding.

- Dental extraction and scaling in hemophilia patients.
- Orthopedic surgeries –laminectomy, knee arthroplasty, spine fixation and total knee/hip replacement.
- Cardiac surgeries.
- Urology -Trans urethral resection of prostrate.
- Epistaxis.
- Liver transplantation surgery.
- Upper GI bleeding
- Trauma

Hereditary angioneurotic edema where it decreases the attacks by decreasing plasmin induced complement activation.

CONTRAINDICATIONS

- Active thromboembolic diseases like DVT, pulmonary embolism and cerebral thrombosis.
- Hypersensitivity to TXA or any of the excipients.
- Massive renal heamorrhage .
- Subarachnoid hemorrhage – since there is a risk of cerebral edema and infarction .
- Patients with acquired defective colour vision.

Should be used with caution

- Patients with Drug allergy
- Renal disease patients.
- Elderly individuals with impaired renal function- dose has to be reduced.
- Pregnancy since this is a category B drug
- Upper urinary tract bleeding-risk of clot obstruction of the tract
- In children <2yrs of age

SIDE EFFECTS

- Commonest –gastrointestinal- Nausea, vomiting, diarrhea, occurs in 10% cases. Dose related.
- Giddiness and hypotension – if the drug is given by sudden rapid intravenous injection. so the recommended dose of infusion is 50mg/min of 1%TXA administered at 5ml/min.
- Defective colour vision – in prolonged use.
- Thromboembolism – rare.
- Drug allergy – in <1% cases.
- Uncommon (>0.1% to <1%)-allergic dermatitis

- Gastrointestinal disturbances[14] usually subside when the dose of TXA is reduced. Giddiness and hypotension have been reported infrequently.

- Episodes of hypotension have occurred after rapid intravenous injection of TXA. To avoid this response, the solution should not be injected rapidly more than 1 ml per minute.

Worldwide post-marketing surveillance data indicates thromboembolic events (e.g. deep vein thrombosis, pulmonary embolism, cerebral thrombosis, acute renal cortical necrosis, and central retinal artery and vein obstruction) have been rarely reported in patients receiving TXA for indications other than hemorrhage prevention in patients with hemophilia (<1/1000).

There have been few reported instances of transient disturbance of colour vision associated with the use of TXA. Patients who develop this symptom should discontinue therapy. Hypersensitivity skin reactions have also been reported with TXA use.[13,14]

DRUG OVERDOSAGE[13]

Tatas about over dosage are limited. One case report of drug overdosage(37gms) reported.

SYMPTOMS

Headache, dizziness, nausea, vomiting, orthostatic symptoms, hypotension.

ANTIDOTE

No antidote known. Activated charcoal can reduce the absorption of drug if given within 1 hour of ingestion.

Cardiac and Respiratory support

Moniter:Blood gas analysis, blood count, renal function, electrolytes.

TRANEXEMIC ACID IN VARIOUS SURGERIES

Many surgical procedures can cause significant intra operative and post operative blood loss. This may cause a need for blood transfusion. Allogenic products of blood transfusion are associated with risk for immunological reactions, HIV, TRALI, etc.

Koch et al[16]postulated that the perioperative red blood transfusion is a single most reliable factor associated with increased risk of postoperative morbid events.so its use in various surgeries limits the need for blood transfusion thereby preventing the need for blood transfusion related complications.

IN OBSTETRICS

TXA of 1g IV used in 67 subjects with abruption placenta that reduces the perinatal mortality with no adverse effects or maternal death.(syanberg et al)[17]

Tranexamic acid, 3gm intravenous infusion over 24 hours was also used with good effect in a woman with central placenta praevia who presented as an obstetric emergency with very heavy bleeding[18]

POST PARTUM HAEMORRAGE:

It is defined as blood loss>500ml for vaginal delivery, and >1000ml for caesarean section. its has been estimated to be about 4% for vaginal delivery and 6% for caesarean section.

Abouzahr et al (1998) postulated that PPH accounts for 1 lakh maternal deaths per year. Many randomized nonblind and double blind trials were conducted. In one nonblind trial (**Ducloy Bouthers et al**)[19] conducted over 77 patients who had vaginal delivery who had PPH was treated with 4 gms tranexamic acid and 1gm/hr for 6 hrs over infusion when compared to similar group who have not received the drug, the duration of bleeding was significantly shorter ($p<0.01$) with tranexamic group when compared to placebo group.Bleeding has stopped significantly in tranexamic group than control group (64% vs46%; $p<0.05$).

Gohel M, et al[20] evaluated the effect of tranexamic acid in caesarean section. They showed that tranexamic acid significantly reduces the quantity of blood loss from placental delivery to 2 hour postpartum, 372.71 ml in the study group versus 469.70 ml in the control group (P = 0.003) . It also reduces significant blood loss from the end of LSCS to 2 hours postpartum, 75.71 ml in the study group verses 133.03 ml in the control group (P = 0.001).

SuQF, Tastsumoto K, GaiMy et al[21] conducted a prospective randomized case control trial. In this study 180 primipara were randomized into 2 groups. In the study group, 91 women received tranexamic acid immediately before LSCS where as in control group 89 women did not receive tranexamic acid. The quantity of blood loss measured in both groups. In study group from the end of CS to 2 hour postpartum. 42.75 ±40.45 ml versus 73.98 ± 77.09 ml in control group.

IN GYNAECOLOGY

AUB- heavy menstrual bleeding is defined as a blood loss of more than 80 ml /day. Normal blood loss will be 30-50 ml /day. Abnormal blood loss may be due to hormonal imbalance or local uterine pathologies like uterine fibroid ,cervical polyps Increased fibrinolytic activity seen in women with heavy menstrual bleeding . This makes to use fibrinolytic agent for treating the patients with AUB as an alternate due to hormonal medications and non steroidal anti inflammatory drugs.

The efficacy of tranexamic acid in the treatment of heavy menstrual bleeding has been studied in many randomized trials.

In one study by **lukes et al**[22],a double blind randomized trial,115 patients with heavy menstrual loss was treated with 1.3g tablet tranexamic acid three times daily for 5 days and reduction in menstrual loss by 40%when compared to placebo group.

CONISATION OF CERVIX:

Study by **Westerberg et al**[23],a double blind randomized trial placebo controlled study was carried over patients who were undergoing conization of cervix. They were treated with 1.5gm of oral tranexamic acid 3times daily for 12 daysafter the procedure. There was significant ($p<0.05$)reduction in postoperative bleeding by 70%.

MYOMECTOMY

Tasci y, caglar et al (2008)[24] studied the effect of tranexamic acid use in women undergoing myomectomy for controlling intraoperative and postoperative bleeding.the results showed a statiscally significant difference between two groups when compared for postoperative ($p<0.01$).

Total blood loss ($p=0.03$)but the perioperative blood loss($p=0.12$) and requirement for blood transfusion ($p=0.25$)were similar in both groups. No adverse reactions noted.

CARDIAC SURGERIES

Cardiac surgeries like valve replacement, coronary bypass grafting are usually performed with cardio pulmonary bypass. This procedure usually have excess bleeding due to derangement of coagulation system and fibrinolysis. Many trials have been conducted.

In one randomized trial by **Katsarol et al**(1996)[25]intravenous tranexamic 10mg/kg has significantly reduced the postoperative blood loss in tranexamic acid group (474 ml vs 906ml) when compared to control group and blood transfusion with($p<0.05$-0.0001).

GASTROINTESTINAL SURGERY

Upper gastro intestinal bleeding usually results from ulceration or erosion.six large trials have been conducted with significant good outcome for tranexamic groups.

Hendry et al (1983)[26] study with tranexamic acid for upper gastro intestinal bleeding,there was significant reduction in bleeding in tranexamic group compared to control group(6.3% vs 13.55;$p<0.01$)

Errikkson et al [27]study stated that tanexamic acid is an aid for reducing blood transfusion in gastric and duodenal bleeding.

IN TRAUMA

Globally millions of people are dying due to road traffic accidents and other types of trauma .In trauma patients hemorrhage is the major

cause of death. Hyperfibrinolysis are frequently encountered in severely injured patients. Every year three million people are dying as a result of trauma.Haemostasis is responsible for integrity of circulation after severe trauma.

Crash 2 Trial[28]

A large multinational randomized trial was carried out over 20211 patients.The efficacy of tranexamic acid was studied on adult trauma patients.within 8 hrs of trauma the patients who had or at risk of heavy bleeding were treated with1gm of intravenous tranexamic acid as loading dose and 1gm infused for 8 hrs or placebo.

They were followed up for 4 weeks. Tranexamic acid had significantly reduced all cause mortality at 4 weeks. The RR of death due to bleeding was 0.85 (95% CI 0.76,P=0.07).

ORTHOPAEDIC SURGERY

Mehr and Sadeghi et al [29] conducted a prospective randomized double blind study, to study the efficacy of tranexamic acid versus placebo group in patients undergoing hip fracture surgery. study was conducted over 67patients with 32patients in tranexamic group and 35in control group who didn't receive the drug.

Patients in study group received tranexamic acid 15mg/kg preoperatively prior to incision and in infusion for 3 hrs later. The mean

blood loss was calculated between two groups and found to be significant reduction in tranexamic acid group when compared to control group (950ml vs 1484ml).

The proportion of patients received blood transfusion was also significantly less in tranexamic acid group (37% vs 57%) and also have demonstrated significant ($p<0.001$)reductions in postoperative the mean packed red blood cell transfusion (1.25 Vs 1.95) .No side effects were noted in study group.

Hiippla et al[30] reviewed the efficacy of tranexamic acid in controlling preoperative blood loss and transfusion requirements of packed red cells in patients undergoing total hip arthroplasty.

In total hip arthroplasty a pneumatic tourniquet will be applied prior to incision to provide a blood less field. But this may enhances the fibrinolytic system locally and thus causes increase in postoperative blood loss usually in the first 6 hrs of postoperative period from the release of torniniquet.study was conducted on 77 patients of which 39 patients received 15mg/kg tranexamic acid prior to incision and 6hrs postoperatively by infusion.

POST PARTUM HEMORRHAGE

The most common form of obstetric hemorrhage is post partum hemorrhage. Obstetric hemorrhage is the world leading cause of maternal mortality. It accounts for about 35% of all maternal death of which 60% occurs in developing countries[31]. These deaths have a major impact on lives and health of the families affected.

Between 1990 and 2010 there was a global reduction in maternal death and MMR from 54300 and 400 to 28700 and 210 per 1 lakh population. However the developing countries continue to experience high maternal deaths when compared to developed countries[32].

WHO report in 2000 stated that women in developing countries are 40 times more susceptible to die during child birth when compared to those in developed countries. WHO 2004 – about 14 million cases of obstetric hemorrhage occur every year.

In the developing world , PPH is responsible for one maternal death every 7min. in 1990, MMR in developing countries was 240/lakh live births when compared to 16/lakh in developed countries.

MDG5 aims at reducing the MMR by 75% by 2015. About 35 nations have been identified as either making insufficient or no progress towards achieving MDG5[33]. So prevention is better than cure hence WHO recommends active management of 3rd stage of labour (AMSTL)

which can prevent PPH by 50%[34] Even with AMSTL about 3 to 16.5% of women are prone to PPH and need further management. WHO 2012 guidelines have recommended the use of tranexamic acid in all surgeries to reduce the blood loss, as an alternative treatment of PPH when the blood loss is partly due to trauma or other uterotonics unavailable[35].

CLASSIFICATION OF PPH

Purpose to classify

- Disease progression is so rapid and so there is a need to determine the amount of blood loss.
- To assess the prognosis so the prognostic classification will guide the degree of aggressiveness of intervention and management through more than one specialty.
- To allow effective communication based on standardization of the estimate, degree of hemorrhage and standardizing management options.

CLASSIFICATION THROUGH VARIOUS FACTORS:

1. **Conventional Temporal Classification**[36]

Based on timing of onset of bleed in relation to delivery

A) PRIMARY PPH: Hemorrhage within 24 hours of delivery

B) SECONDARY PPH: Hemorrhage occurs after 24 hours of delivery but within 6 weeks of delivery

2. **HEMATOCRIT CHANGE: ACOG 2006**[37]

Blood loss which decreases the hematocrit by more than or equal to 10% and necessitates the blood transfusion

3. **RAPIDITY OF BLOOD LOSS**[38]

Severe hemorrhage is

- blood loss of >150ml/min
- >50% of blood volume within 20 mins
- >2500 ml or more than or equal to 5 blood transfusion within 24hrs

4. **Wac et all 2005** [39]

Classified the PPH with the causative factors:

They are 4 'T's:

- Tone –(noncontracting atonic uterus(70%)
    - Overdistended uterus- Multiple pregnancy,polyhydromnios, Prolonged labour
    - Halogenated anesthetics
    - Chorioamnionitis

- Uterine relaxants
- Grand multiparty
- Fetal Macrosomia >4kg

- Tissue - adherent placenta, retained placenta (10%)
- Trauma(10%)
  - Prior uterine surgery-Myomectomy,caesarean section
  - Obstructed labour
  - Excess cord traction
  - Episiotomy /tears
  - Uterine rupture
  - Genital tract lacerations
  - Uterine inversion
- Thrombin (coagulopathy) 1%
  - Acquired
    - Thrombocytopenia of pregnancy
    - DIC
    - IUD
    - Abruptio placenta

- Amniotic fluid embolism
- Sepsis
- Gestational hypertension
- Eclampsia

❖ Herediary: Von willebrands disease

❖ Anticoagulant therapy: Aspirin & Heparin

5. Amount of blood lost:[40]

Blood loss at delivery is estimated using various methods. These range from the less modern methods of counting blood soaked pieces of cloth or 'kangas' used by traditional birth attendants in rural settings to more modern techniques such as using a calibrated drape that is placed under the buttocks.

Also calculating the blood loss by subtraction after weighing all swabs using sensitive weighing scales.

6. Based on clinical signs and symptoms:

Bonner J et al(2000) [41]

He classified the blood loss into compensatory, mild, moderate and severe with respect to clinical signs and symptoms.

Table: 1 Classification of Blood loss by Bonner

Types	Blood Loss (in ml)	TBV	BP(mm Hg)	Signs / symptoms
Compensatory	500- 1000	10-15%	No change	Palpitations dizziness
Mild	1000-1500	15-25%	Slight fall of 80-100mm Hg	Sweating tachycardia
Moderate	1500-2000	25-35%	marked fall 70-80	Pallor, oliguria Restlessness
Severe	2000-3000	35-45%	Profound fall 50-70	Air hunger anemia collapse

7. **WHO CLASSIFICATION** - all blood loss more than 500ml:

Average blood loss for vaginal delivery is 500 ml and for caesarean section is around 1000 ml, for caesarean hysterectomy, around 1500 ml. Any amount of blood loss more than this should be considered as PPH.

Table-2: THERAPEUTIC GOALS OF MANAGEMENT OF MASSIVE BLOOD LOSS:

Hb	>8 g/dl
Platelet count	>75*10 9/L
PT	<1.5* mean
Fibrinogen	>1 g/L
aPTT	<1.5* mean

Blood volume restoration and that of oxygen carrying capacity of RBC is the corner stone of resuscitation. Hence the blood loss should be correctly estimated.

Classifications based on the need of blood transfusion and causative factors, the ideal classification should consider both the volume loss and the clinical consequence of it.

Women in the developing countries like india are antenatally complicated with anemia, undernourished and cannot even withstand with the normal blood loss like any women in developed countries.

Henceforth in order to reduce the maternal morbidity and mortality due to PPH ,it is essential to give good antenatal care , anemia correction and reduce blood loss during delivery. This can be ***achieved with oxytocin and antifibrinolytic drugs like tranexamic acid to prevent PPH .***

MANAGEMENT OF PPH

The management of PPH includes:

1. Recognition
2. Communication
3. Resuscitation

4. Monitoring
5. Investigation
6. Treatment

Reducing the caesarean section blood loss

By the following measures

1. Preoperative measures
2. Intraoperative measures
3. Post operative measures

Preoperative measures: correcting antenatal anemia

1. Antenatal Hb% and blood grouping and Rh typing
2. Secure IV lines
3. Blood reservation in high risk cases
4. Coagulation abnormality if present have to be corrected before surgery in cases of abruption placentae, IUD and HELLP syndrome
5. Prophylactic use of antifibrinolytic drugs before surgery
6. Avoid excess and prolonged anaesthesia

Intraoperative measures

1. Joel Cohen incision- A straight transverse incision made 3cm above the pubic symphysis in which rectus sheath is stretched with fingers without incising with scissors
2. Lower segment caesarean section (avoiding classical caesarean section)
3. Sharp method of expansion of uterine incision
4. Active management of third stage of labour(AMTSL) in caesarean section
    I. Early administration of oxytocics immediately following the delivery of the baby
    II. Controlled cord traction after placental separation
    III. Uterine massage
5. Avoid undue prolongation of surgery
6. Making J or inverted T shaped incision in obstructed labour
7. Using pattwarthans or modified pattwarthans method in cases of obstructed labour to deliver the baby.
8. Placental bed drainage will reduce its bulkiness and allow the uterus to contract ,thereby aids its delivery
9. Interior uterine closure for high risk cases

MISGAV LADACH TECHNIQUE[61]

This technique was described in 1994 by Dr.Michel Stark,the presient of New European surgical academy. He was the director of Misgav Ladach general hospital in Jerusalam.

His method was based on minimalistic principles.

Its components are

1. Modified Joel Cohen abdominal wall incision(blood vessel injury avoided)
2. No abdominal swab used
3. Single layer uterine closure
4. No need for peritoneal closure
5. Rectus muscle should not be approximated.

Post operative measures

1. Intensive Post operative monitoring of high risk cases
2. Continue oxytocics in the immediate post partum period in high risk cases

Management of PPH during caesarean section:

A systematic and stepwise management of PPH can be achieved with the use of the mnemonic “HAEMOSTASIS”

HAEMO –medical management

H - ask for help

A - Assess the vital parameters

E - Ensure availability of blood

Establish etiology -4T’s

Ecbolics (oxytocics)

M - Manual compression & massage the uterus

O - oxytocin

STASIS –surgical management

S- Shift to operation theatre,bimanual compression and antishock garments if transfer is required(NASG-Non pneumatic anti shock garment)

T - rule out tissue and trauma

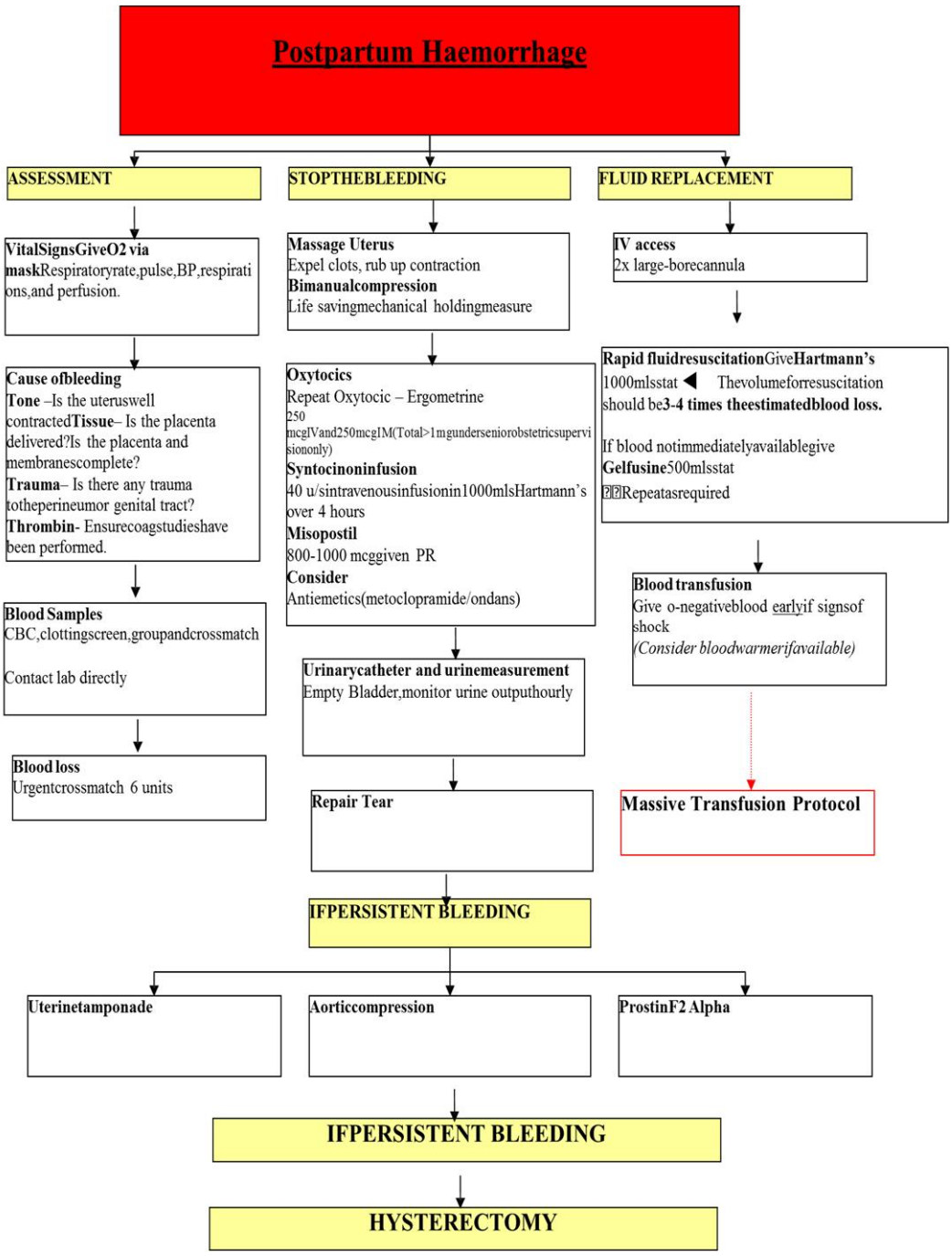
A - apply compression sutures

S - stepwise devascularisation

I - intervention radiology (uterine artery embolisation)

S - surgery (Subtotal hysterectomy)

Fig : 4 Management of Postpartum Hemorrhage



CESAREAN SECTION

Cesarean delivery is one of the most commonly performed operations today. As medical science and especially obstetrics has evolved over the recent years, there has been a parallel and steady increase in the rate of cesarean births.

Cesarean section is the surgical procedure by which baby is delivered from the intact uterus through abdominal & uterine incision after 28 weeks of gestation.

From times when childbirth was an event not necessitating medical attention to the present times when concerns are voiced about high cesarean delivery rates, obstetrics has for sure, travelled a long way.

Trends in India

India is also experiencing a rapid increase in c-section delivery along with an increase in institutional deliveries and growing access to gynecological and Obstetric care. The high rural urban differences in rates invoke speculation on the possible reason for such an increase.

Reliable data on the incidence of c-section is available in India only from the National Family Health Survey (NFHS) conducted during 1992-93. Hence, the trend of c-section deliveries analyzed from 1992-93 to 2005-06 shows an upward trend in c-section rates.

The present analysis is based on the data derived from different rounds of NFHS.

At the all-India level, the rate has increased from 2.9% of the childbirth in 1992-93 to 7.1% in 1998-99 and further to 10.2% in 2005-06. However, this scenario itself cannot be considered as a sharp increase, nor does the figure exceed the tolerable limit specified by the WHO.

In fact, the rate of increase has marginally declined if we compare 1992-93 to 1998-99 with 1998-99 to 2005-06. What has been alarming in the case of India is the wide heterogeneity in the incidence of c-section across states and regions. It is evident from the analysis that in 2005-06, seven out of 19 states reported over 15% or more caesarean childbirth.

Over the last 15 years the increase in c-section delivery has been substantial in many states. Interestingly, all the southern states recorded c-section delivery as high as in countries with the highest level of c-sections in the world.

The rates recorded in Kerala, Andhra Pradesh and Goa are alarming. The data indicate that states with marked demographic transition also record a high incidence of c-section, although the real cause of such an increase would be different.

SURGICAL ANATOMY FOR CESAREAN DELIVERY[42]

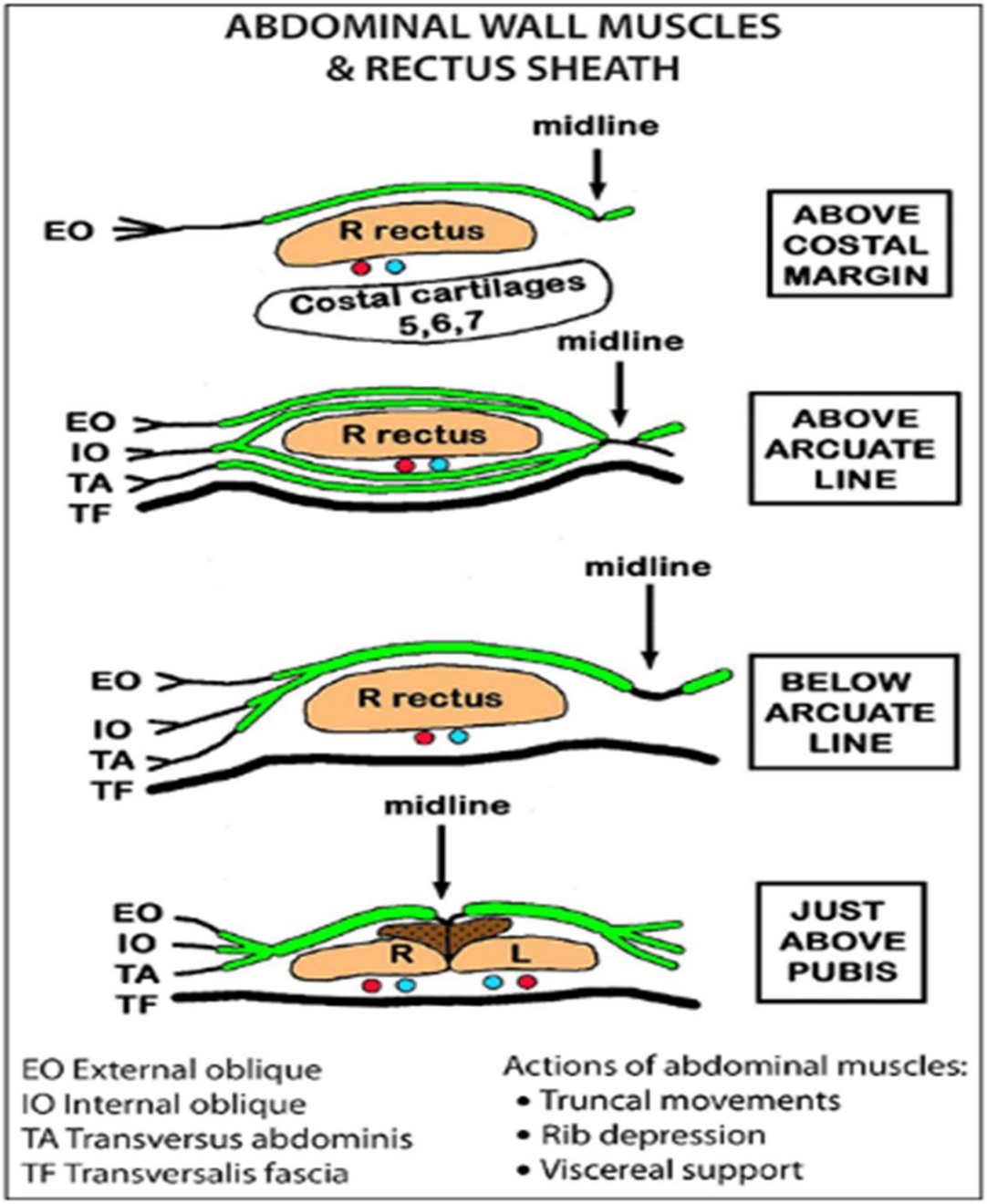
THE ABDOMINAL WALL:

Cesarean delivery is defined as the birth of the fetus through an incision in the abdominal wall and uterine wall. Knowledge of the layered structure of the abdominal wall permits the surgeon to enter the abdominal cavity during cesarean delivery with maximum efficiency and safety.

The summary of the abdominal wall layers is provided in following box.

- Skin
- Subcutaneous layer
- Camper's fascia
- Scarpa's fascia
- Musculo-aponeurotic layer
- Rectus sheath
- Rectus abdominis muscle
- External/ Internal oblique muscle
- Transverse abdominal muscle & fascia
- Peritoneum

Fig : 4 Abdominal Wall Muscles



As the incision for the caesarean section is made, the above layers are incised.

Skin

The skin near the midline is supplied by the branches of the superior epigastric artery (branch of the internal thoracic artery), the inferior epigastric artery (branch of the external iliac artery) and the superficial epigastric artery, which is a branch of the femoral artery.

The superficial arteries accompany the cutaneous nerves. Those that accompany the lateral cutaneous nerves are branches of the posterior intercostals arteries, while those that travel with the anterior cutaneous nerves are derived from the superior and inferior epigastric vessels.

The superficial inferior epigastric vessels run a diagonal course in the subcutaneous tissue from the femoral vessels toward the umbilicus, beginning as a single artery which branches extensively as it nears the umbilicus.

The skin of the flanks is supplied by branches from the intercostals, lumbar and deep circumflex iliac arteries. The venous blood is collected by a network of veins that radiate from the umbilicus The network above the umbilicus drains via the lateral thoracic vein & the axillary vein into the superior vena cava and below the umbilicus via the superficial epigastric & great saphenous veins into the femoral vein, and finally into the inferior vena cava.

A few small veins, the paraumbilical veins, connect the network through the umbilicus and along the ligamentum teres to the portal vein.

Blood supply of the abdominal wall

The main arterial supply of the abdominal wall consists of the superiorepigastric, musculophrenic, deep circumflex iliac and Inferior epigastric vessels. The medial part of the abdominal wall receives blood from the epigastric arteries, while the musculophrenic and deep circumflex iliac arteries supply the lateral wall.

The lateral wall is also supplied by the lower intercostal and lumbar arteries (T8 toT12 and LI). This freely anastomosing vascular system provides one continuous arterial and venous channel on both sides of the anterior abdominal wall, extending from the subclavian vessel cephalad to the external iliac vessels caudal. The linea alba is relatively bloodless.

The limited vascular supply in this area of fascial fusion can impair wound healing when lower midline incisions are used. Thus, a secure closure is mandatory in such incisions.The Superior epigastric artery, one of the terminal branches of the internal thoracic artery, enters the upper part of the rectus sheath.

The artery descends behind the rectus muscle, supplying the upper central part of the anterior abdominal wall and anastomoses with the

inferior epigastric artery. The inferior epigastric artery is a branch of the external iliac artery just above the inguinal ligament. It runs upward and medially along the medial side of the deep inguinal ring. It pierces the fascia transversalis to enter the rectus sheath anterior to the arcuate line.

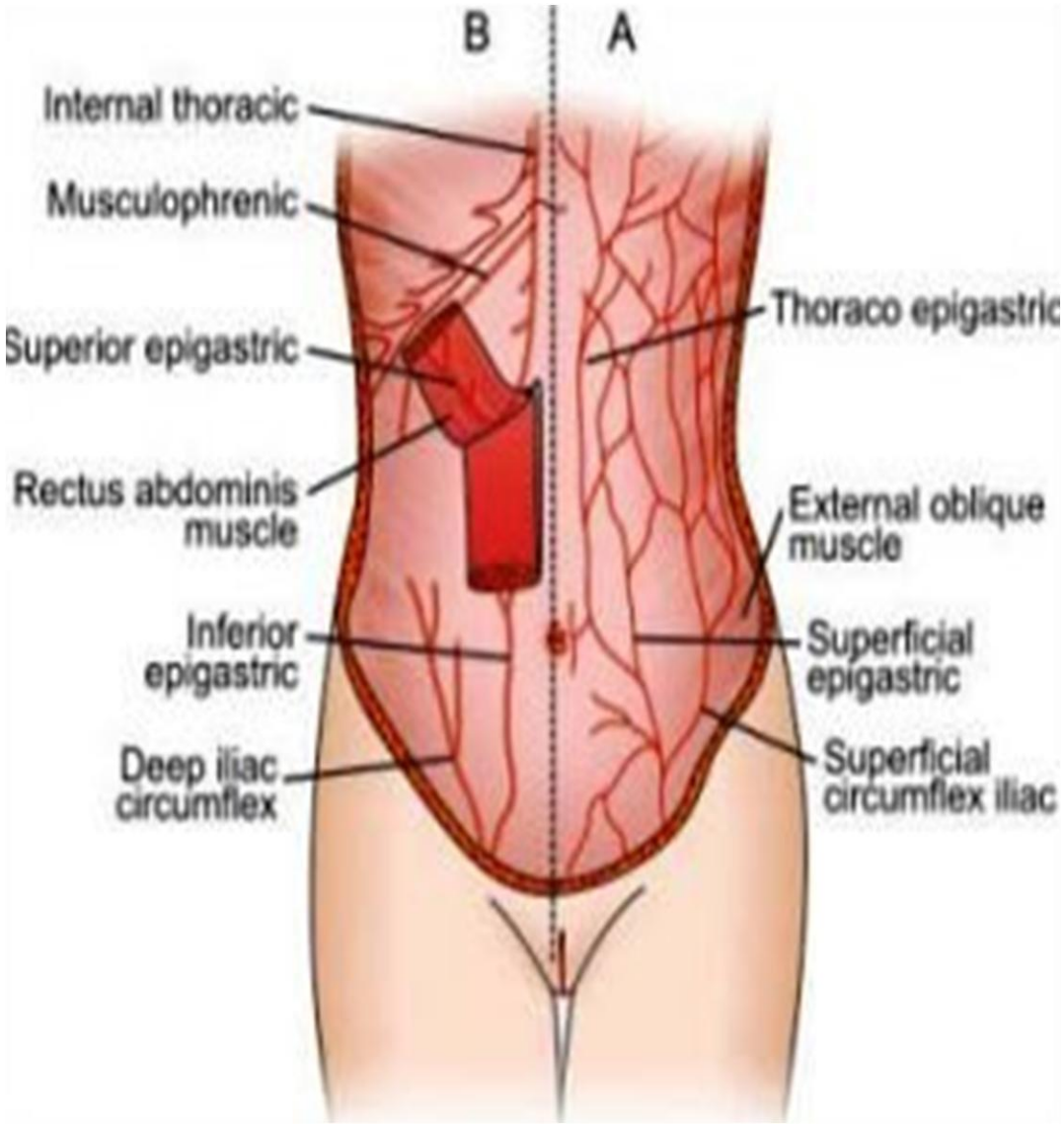
It ascends behind the rectus muscle, supplying the lower central part of the anterior abdominal wall and anastomoses with the superior epigastric artery. The deep circumflex iliac artery is a branch of the external iliac artery just above the inguinal ligament.

It runs upward and laterally towards anterosuperior iliac spine and then continues along the iliac crest. It supplies the lower lateral part of the abdominal wall.

The lower two posterior intercostal arteries, branches of the descending thoracic aorta and 4 lumbar arteries, branches of the abdominal aorta, pass forward between the muscle layers and supply the lateral part of the abdominal wall.

The epigastric vessels are subject to injury, particularly when a muscle splitting incision is used. Also, the deep circumflex or musculophrenic vessels can be injured when an extraperitoneal approach is chosen.

Fig:5 Blood Supply of Anterior Abdominal Wall



VENOUS SYSTEM

The venous blood from the skin is connected in to a network of veins that radiate from the umbilicus. The network drains above into the axillary vein via the lateral thoracic vein and below into the femoral vein via the superficial epigastric & great saphenous veins.

A few small veins, the paraumbilical veins, connect the network through the umbilicus and along the ligamentum teres to the portal vein. They form a clinically important portosystemic venous anastomosis.

The superior epigastric, inferior epigastric, and deep circumflex iliac veins follow the arteries of the same name and drain into the internal thoracic and external iliac veins. The posterior intercostal veins drains into the azygous veins and the lumbar veins drain into the inferior vena cava.

Blood supply of the uterus

The uterine artery is the predominant vessel supplying the uterus. There are two uterine arteries, one arising on either side as a branch of the anterior division of the internal iliac artery. It runs medially towards the cervix, crosses the ureter above the lateral vaginal fornix and 2 cm lateral to cervix, ascends upwards along the lateral uterine wall between the two leaves of the broad ligament and then underneath the fallopian tube anastomoses with the ovarian artery.

The uterine vessels anastomose with each other extensively. Each uterine artery gives rise to anterior and posterior arcuate branches along the length of the uterus. These pass transversely into the uterine myometrium giving off radial branches before anastomosing with their counterpart.

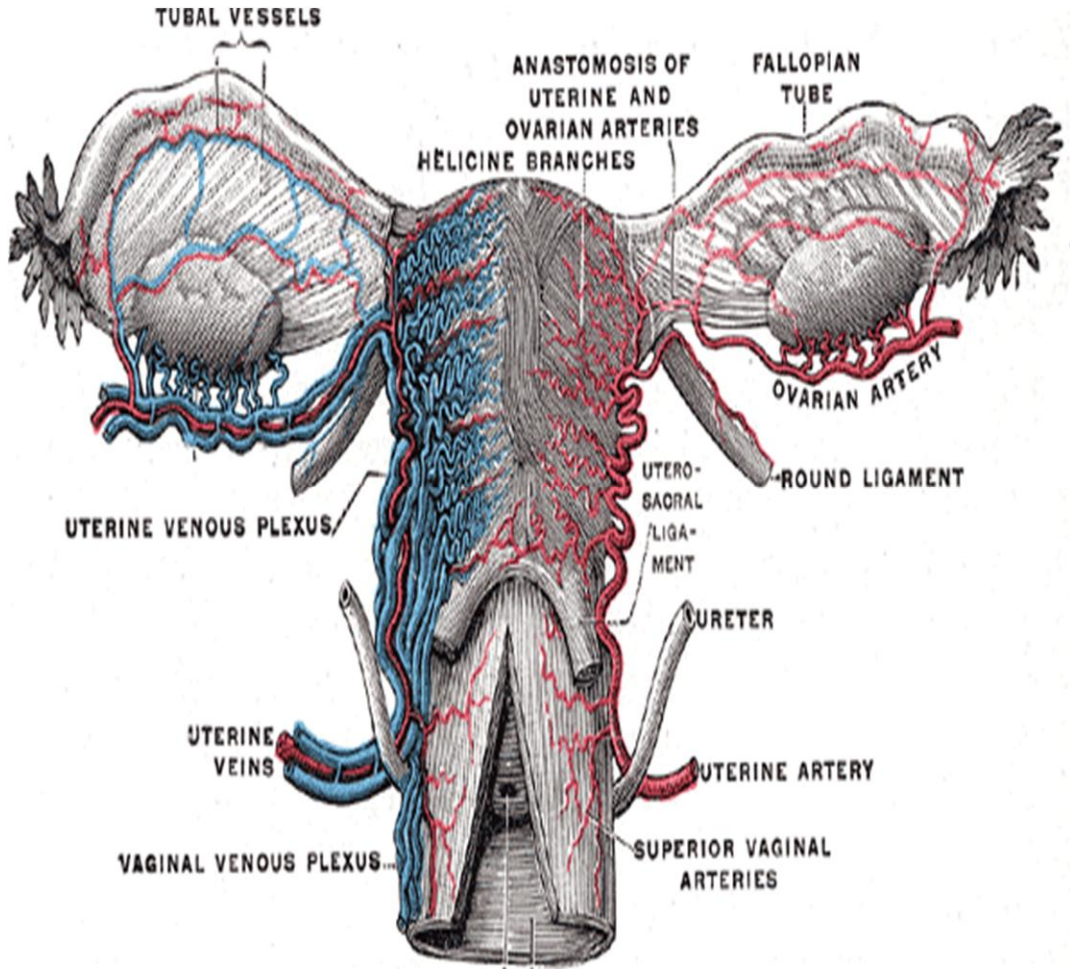
The radial branches, before reaching the endometrium, supply a basal branch to the basal zone of decidua and enter into the decidua as the tortuous spiral arteries. There is marked spiraling of the uterine arteries that reaches its maximum at 20 weeks. Later, they become straight and engorged, with the blood flow increasing from **50 ml / min to 450 - 650 ml / min**.

The uterine veins, which too become engorge during pregnancy, run along with the arteries and drain in to the internal iliac veins. The ovarian artery arises from the abdominal aorta just below the renal artery. It descends along the retroperitoneal space along the posterior abdominal wall, crossing the ureter near its origin from the renal pelvis, and enters the suspensory ligament of the ovary.

It courses underneath the fallopian tube before anastomosing with the uterine artery. The ovarian vein, arising from the pampiniform plexus at the ovarian hilum courses along with the ovarian arteries and drains into the inferior vena cava on the right side and in to the left renal vein on the left side.

The blood loss during caesarean section could be because of inferior epigastric artery, injury or extension of the uterine artery. It could also because of upper uterine segment incision or manual removal of placenta etc. The use of tranexemic acid decreases the blood loss by 30%. Tranexemic acid acts by inhibiting the plasminogen activator and there by the inhibiting the fibrin degradation.

Fig: 6 Blood Supply and Venous Drainage to Uterus



BLOOD LOSS MEASUREMENT

- The Joint Commission in 2010[43] stated that the leading cause of maternal morbidity and mortality is the failure to recognize excessive blood loss that occurs during childbirth.

- The magnitude of the problem is so high .In 2009 Newyork state department of Health[44] has issued the health advisories and informed health care providers to prevent maternal death by improving the recognition of hemorrhage and response to it early.

- Visual estimation of blood loss is common practice in obstetrics. But it has its own limitation and its inaccuracy has been demonstrated by various studies[45]

- Patel et al(2006)[46]stated that the use of visual estimation of blood loss(EBL)can result in underestimation of blood loss by 33- 50%.

- Duthie et al (1990)[47], Stafford et al (2008)[48]Anazi& Tamim et al (2011)[49]have stated that Visual estimation consistently resulted in underestimation of large volumes.

- Dildy et al (2004)[50] have stated that with smaller volumes, EBL resulted in overestimation compared to direct measurement.

Implications of Inaccurate Evaluation of Blood Loss:

- Overestimation can lead to costly, invasive, and unnecessary treatments such as blood transfusions that expose women to unnecessary risks.

- Underestimation can lead to delay in delivering lifesaving hemorrhage interventions.

- Quantification of Blood Loss (QBL) is an objective method used to evaluate excessive bleeding.

- The quantity of blood loss estimation was started following placental delivery. Following the uterine incision the amniotic fluid was fully suctioned in a suction container that has measurements in milliliter. After the placental delivery the blood lost is suctioned in a separate suction container and measured.

    - The pads used to be weighed before and after surgery (following placental delivery).

    - 1 gram weight = 1 milliliter blood loss volume

- AI Kadri et al (2011)[49] stated that methods to quantify blood loss, such as weighing, are significantly more accurate than EBL.

- Weeber et al., Harding et al(1984)[51]

    - Total blood loss (ml) ={ wt of pad after surgery(gm) _ wt of pad before surgery(gm) }

      +

      Amount of blood in suction container(ml)

- So Amniotic fluid and the amount of blood lost before placental delivery was not included in measuring blood loss in our study.

- At the end of the surgery, the volume of quantified blood calculated by weight added with the volume of quantified blood in the suction container to determine peroperative total QBL[52].To measure postoperative blood loss the pad soaked after completion of LSCS to 2 hours postpartum were separately weighed.

- This gives only the approximate amount of blood loss but this is the only practically feasible method to quantify the blood loss.So we used this method of estimation of blood loss in our study.

- The datas were collected and analysed by using SPSS 16.0V .Descriptive statistics - mean, median, and standard deviation were calculated between two groups. Chi – square test (χ) 2 was used for comparison between groups regard qualitative variables.

- The comparison of quantitative variables were calculated by using significance of difference by independent ‘t’ test with 5% level of significance(α).so P <0.05 is considered significant in our study.

MATERIALS AND METHODS

The study was done by Dr.D. Punitha Meenakshi at Government Chengalpattu Medical College Hospital between November 2013 to August 2014.The source of data for this study are patients who were admitted in the Antenatal ward and Labour ward who were planned for elective and emergency caesarean section at Chengalpattu medical college hospital, Chengalpattu

Inclusion Criteria

- Primi and second gravida with term gestation
- Singleton pregnancy
- Emergency and elective cases for caesarean section

Exclusion Criteria

- Allergic to tranexamic acid
- Severe medical illness like cardiac, Renal and Liver diseases
- Patients with past history of thromboembolic disorders
- Complicated pregnancies at risk of PPH
    - PIH,Preeclampsia

- HELLP
- Anaemia with Hb < 9gms%
- Abnormal placenta –Abruptio placenta,Placenta previa
- Polyhydromnios
- Multiple pregnancy
- Estimated fetal weight > 4kgs (Macrosomia)
- Myoma uterus with pregnancy
- Prolonged labour
- Anesthesia-Halogenated /General anesthesia

Methods

- The subjects of this Randomized Controlled trial were 200 patients who were admitted for elective and emergency caesarean section in labour ward and antenatal ward.
- Detailed obstetric and Medical History was taken in all patients. Their weight and Height were recorded. Vital parameters were checked. General, systemic and obstetric examination was done. USG was done to confirm gestational age, fetal wellbeing, liquor status. Complete blood count at the time of admission and on 3 rd postoperative period was done. Bleeding Time,

Clotting Time at the time of admission. Renal and Liver function test at the time of admission and on 3 rd postoperative period. Urine was examined for Albumin, Sugar and Deposits during admission

- Subjects were randomized by BLOCK RANDOMIZATION.
- 100 Antenatal women were placed in STUDY GROUP (Group A) and 100 antenatal women were placed in CONTROL GROUP(GROUP B) with the same inclusion and exclusion criteria.
- All patients were informed about the study and the effects of drug Tranexamic acid and consent was obtained after counseling the patients.

STUDY GROUP

- Patient in this group received injection Tranexamic acid 15mg /kg dose infusion in 100 ml Ringer lactate solution over 10 - 15 minutes prior to the skin incision.
- After Delivery of Baby during Cesarean Section, they received Injection oxytocin 10 units indramuscularly.

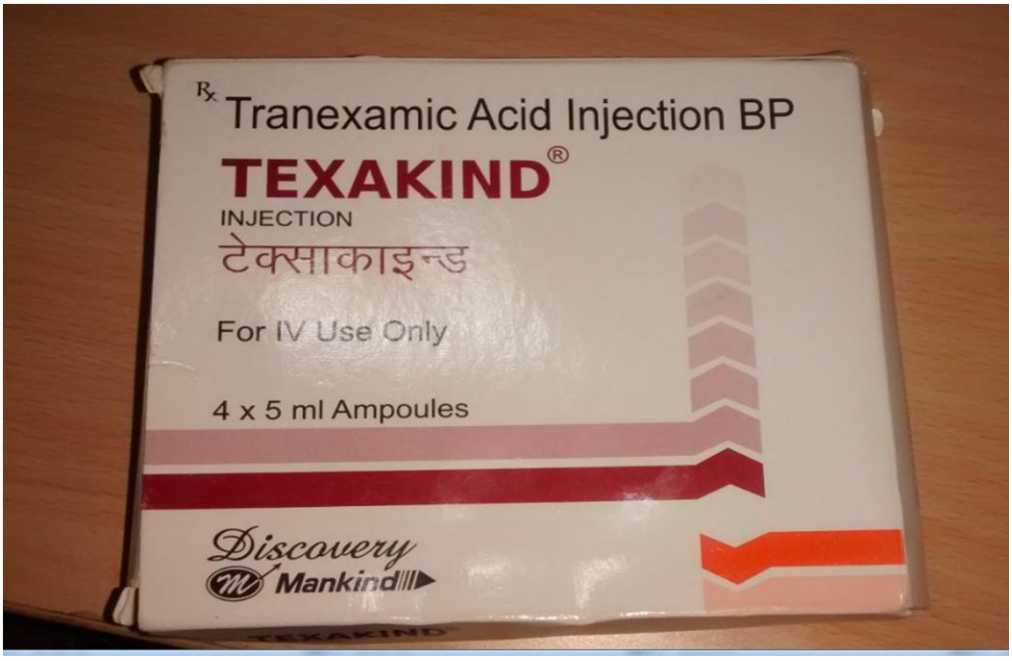
CONTROL GROUP

- Patient in this group did not receive injection Tranexamic acid. Just they received plain Ringer lactate. Lower segment caesarean section was done under spinal anesthesia.

- After the delivery of the baby , they received Injection oxytocin 10 units intramuscularly.

- Both groups received parentral Antibiotics just prior to surgery.

Fig : 7 Injection Tranexamic acid



(I) Age, (II) BMI

Age was recorded from History.

Patients Height and Weight were measured and BMI was calculated from the height and weight using the formula

BMI = Weight in kg / Height in m^2

(III) Parity

Parity was recorded from history

(IV) Indication for Cesarean Section

The indication for Cesarean Section was recorded from Case Sheet

(V) Duration of Cesarean Section

The Duration of Cesarean Section was recorded from beginning of Skin incision to closure of skin.

(VI) Birth weight of Baby

Birth weight of the baby was measured using Baby Scales.

Pre Op and Post Op Vital Parameters: (VII) Heart Rate (VIII) Systolic BP (IX) Diastolic BP (X) Respiratory Rate

Both during preoperative and postoperative periods vital signs were measured Heart rate(HR),Blood pressure(BP) ,Respiratory rate (RR) preoperatively and 2 hours postpartum

(XI) Blood Loss during and following Cesarean Section

Amount of blood loss measured intraoperatively from placental separation to end of surgery. Postoperative blood loss calculated from end of caesarean section to 2 hours postpartum. Total blood loss arrived by the adding blood loss in both periods.

Fig : 8 Electronic Weighing Machine

Fig: 9 Suction Apparatus with container

(XII) Fall in Hb %

This is the difference between Hb % on Admission and Hb % on 3rd Post Operative Day.

(XIII) Incidence of PPH

Blood Loss > 500 ml was considered as PPH

(XIV) Need of Maternal Blood Transfusion

All mothers who had blood transfusion post operatively were considered to be in need of Maternal Blood Transfusion. (Those who had Pre Op Blood Transfusion were excluded from study)

(XV) Use of Additional Uterotonics

Need for any additional uterotonics like

- 2nd Dose of inj.Oxytocin
- Inj.Prostadin Injection
- Tab Misoprostol were noted.

(XVI) Prolonged Hospital Stay

Prolonged Hospital Stay was defined as Stay more than or equal to 9 days. It is customary to discharge the patient on 8th Post Operative day

(XVII) APGAR

APGAR Score was calculated at 1 minute and again at 5 minutes

(XVIII) Admission Rate in NICU

Admission in Neonatal Intensive Care Unit for any reason was considered

Incidence of (XIX) Nausea, (XX) Vomiting, (XXI) Diarrhea, (XXII) Thrombosis

Incidence of the above four conditions were measured in both the study group and control group

OBSERVATIONS AND RESULTS

The overall results of this study are as shown below

(I) Age, (II) BMI

The mean Age in Study Group was 24.05 and the Mean Age in Control Group was 24.47 with. The SD in Study Group was 2.641 and the SD in Control Group was 2.68

The mean weight in Study Group was 56.85 kgs and the Mean weight in Control Group was 57 kgs. The SD in Study Group was 5.776 and the SD in Control Group was 6.184

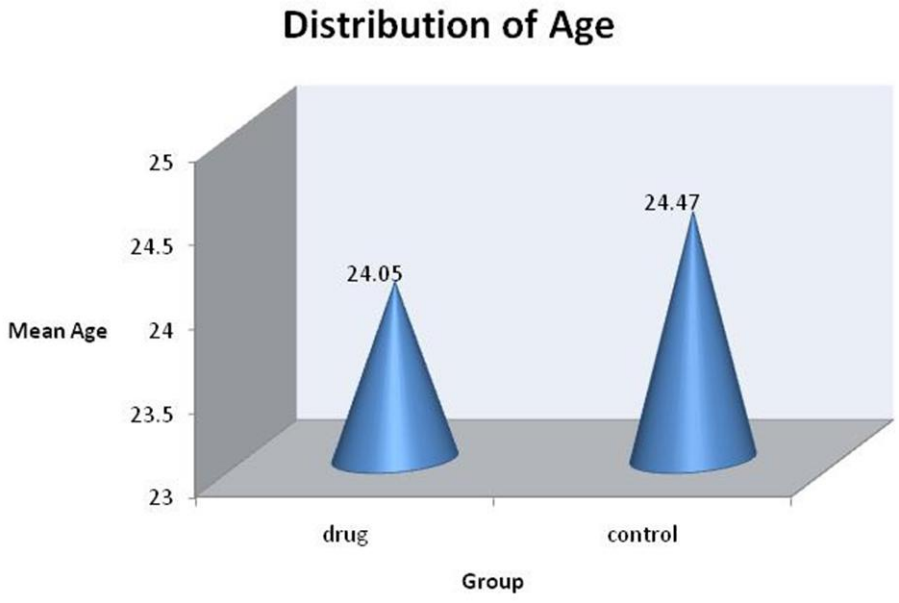
The mean height in Study Group was 155.5 cm and the Mean height in Control Group was 153.84. The SD in Study Group was 4.356 and the SD in Control Group was 7.738. The mean BMI in Study Group was 22.931 and the Mean BMI in Control Group was 23.517

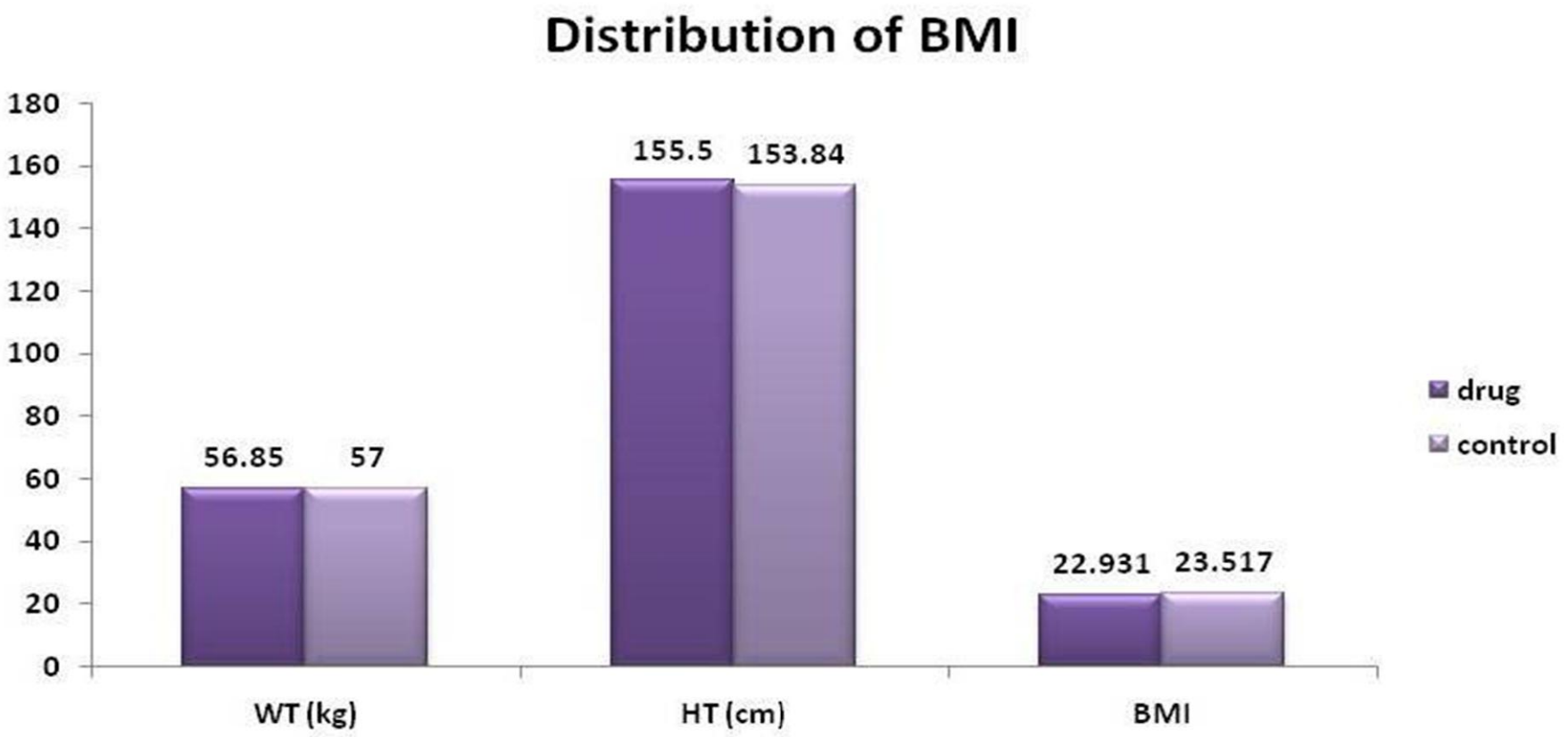
The SD in Study Group was 1.7342 and the SD in Control Group was 2.3474.

't' values and p values were calculated. It was found that confounding variables such as Age, Weight, Height and Body Mass Index (BMI) are matched effectively in both study and control groups.

The differences in confounding variables (Age, Weight, Height, and BMI) in both groups were not statistically significant.

Table: 3 Comparison Of Age BMI						
Character	**Study Group**		**Control Group**		**'t' value**	**P value**
	Mean	**SD**	**Mean**	**SD**		
Age	24.05	2.641	24.47	2.68	1.116	0.27(NS)
Weight	56.85	5.776	57	6.184	0.177	0.86(NS)
Height	155.5	4.366	153.84	7.738	2.01	0.05(NS)
BMI	22.931	1.7342	23.517	2.3474	2.01	0.05(NS)



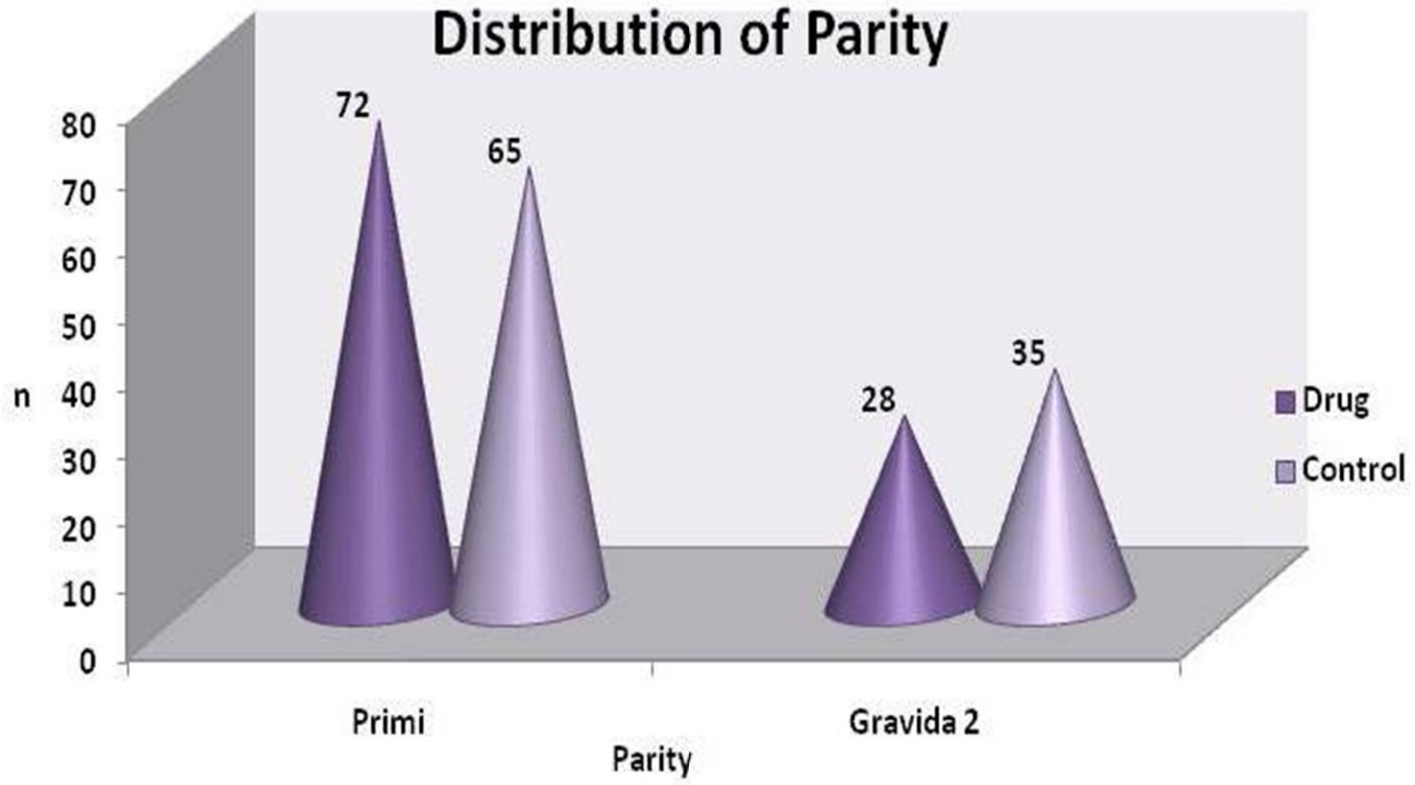

Distribution of BMI
180
160
140
120
100
80
60
40
20
0
56.85
57
155.5
153.84
22.931
23.517
WT (kg)
HT (cm)
BMI
drug
control

(III) Parity

The following table shows the comparison of parity between two groups. 72 patients in Study Group and 65 patients in control group were Primi gravidas. 28 patients in Study Group and 35 patients in Control Group were second gravida. P value is 0.181 which is not statistically significant. Parity was comparable in both groups.

Table :4 Comparison Of Parity

Parity	**Study**	**Control**	**Chi square test**	**P value**
Primigravida	72	65	1.135	0.181 (Not significant)
Second Gravida	28	35		

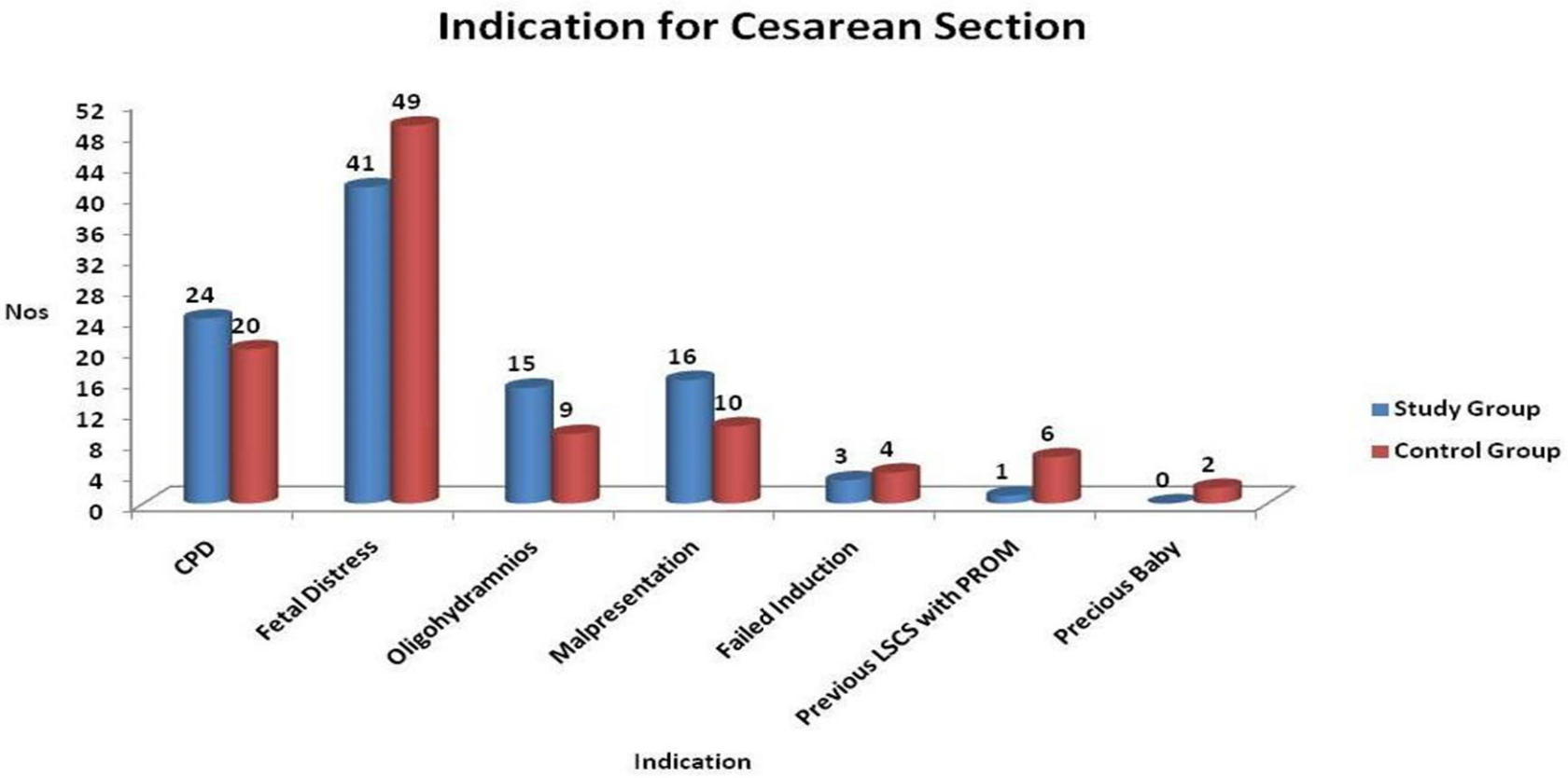

Distribution of Parity
n
80
70
60
50
40
30
20
10
0
72
65
28
35
Drug
Control
Primi
Gravida 2
Parity

(IV) Indication for Cesarean Section

The indications for Cesarean section can have bearing on amount of intra operative and postoperative blood loss. Indication for Cesarean Section between two groups are shown in the following table were compared.

Table :5 Comparison of indication for caesarean section		
Indication for Cesarean Section	**Study Group**	**Control Group**
CPD	24	20
Fetal Distress	41	49
Oligohydramnios	15	9
Malpresentation	16	10
Failed Induction	3	4
Previous LSCS with PROM	1	6
Precious Baby	0	2
P= 0.14 (Not significant) Chi square test		

It is found that in this study, there is no statistical significance in indication for LSCS in both Study Group and control group. Hence This does not act as a confounding variable in this study.


Indication for Cesarean Section
Nos
52
48
44
40
36
32
28
24
20
16
12
8
4
0
24
20
41
49
15
9
16
10
3
4
1
6
0
2
CPD
Fetal Distress
Oligohydramnios
Malpresentation
Failed Induction
Previous LSCS with PROM
Precious Baby
Indication
Study Group
Control Group

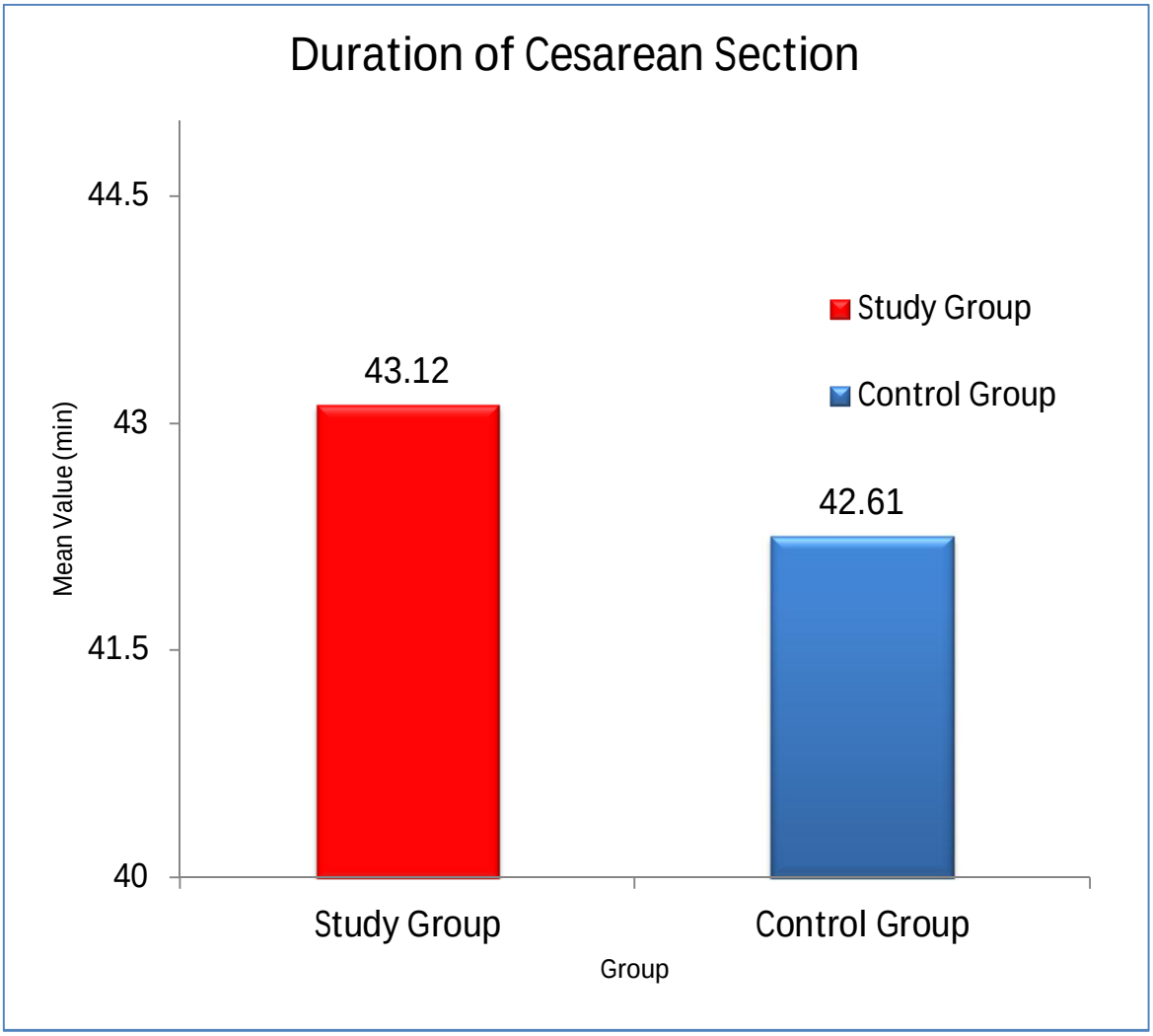
(V) Duration of Cesarean Section

Operating time can affect the amount of blood loss and hence they were studied

Table :6 Comparison of duration of caesarean section						
Variables	Study Group		Control Group		't' value	P value
	Mean	SD	Mean	SD		
Duration of Cesarean Section	43.12	2.337	42.61	2.562	1.47	0.10(NS)

The mean duration of surgery in study group was 43.12 minutes and in Control Group was 42.61 minutes (P=0.10).The difference in duration of surgery in both groups was not statistically significant.

Hence we found that Operating time is not a confounding variable in our study.

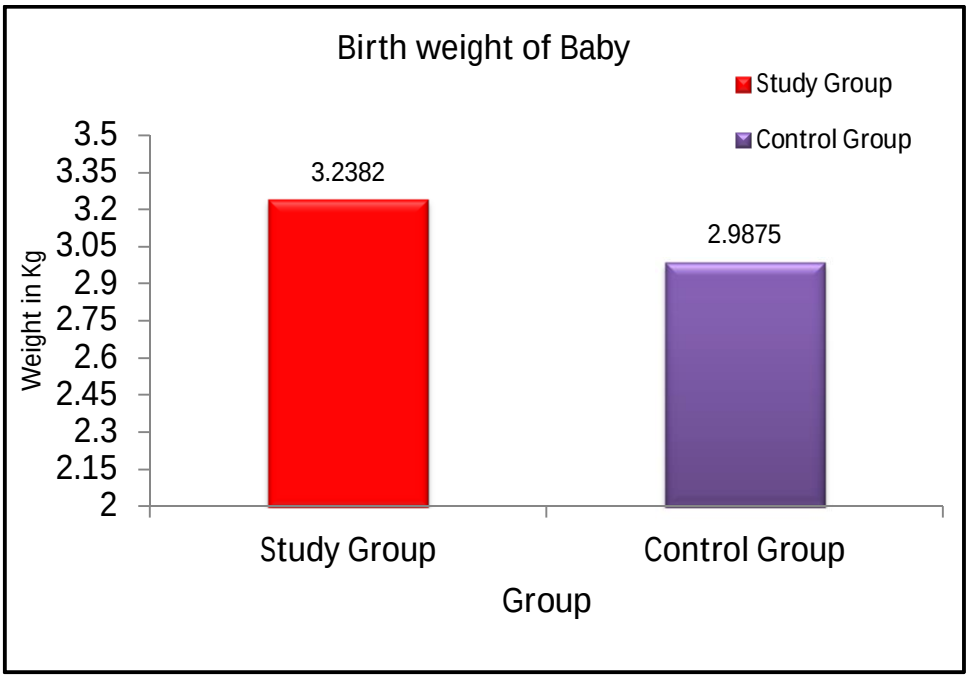

Duration of Cesarean Section
44.5
43
41.5
40
Mean Value (min)
43.12
42.61
Study Group
Control Group
Study Group
Control Group
Group

(VI) Birth weight of Baby

Comparison of (VI) Birth weight of Baby between study and control groups revealed that the mean baby weight in Study Group was 3.2382 kg and in Control Group 2.9875kg (P-0.03) and that there is no statistical difference in birth weight of baby in both the groups.

Table :7 Comparison of Birth Weight of Baby

Variables	Study Group		Control Group		't' value	P value
	Mean	SD	Mean	SD		
Birth weight of Baby	3.2382	2.52961	2.9875	0.4253	0.977	0.33(NS)

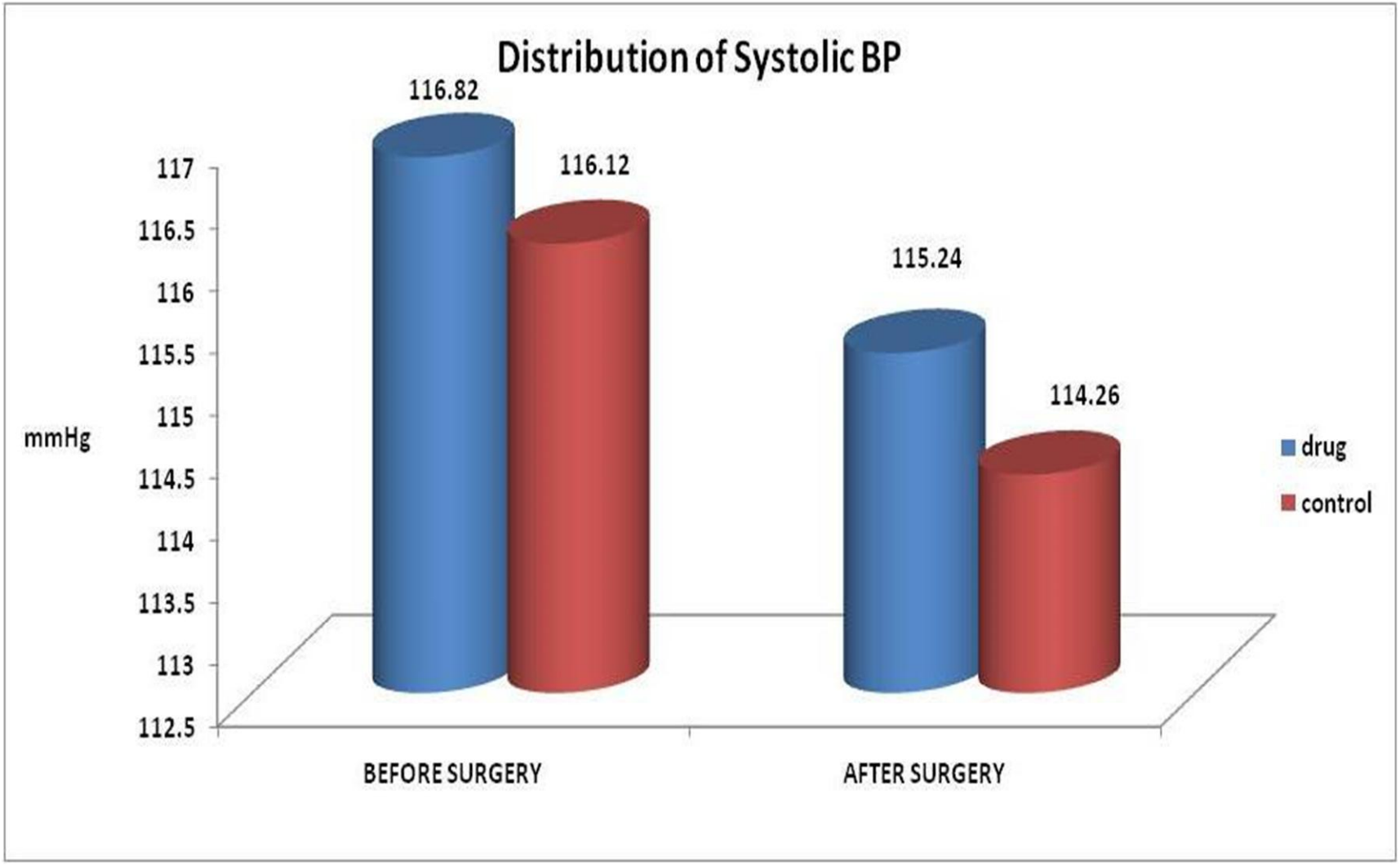


Pre Op and Post Op Vital Parameters: (VII) Heart Rate(VIII) Systolic BP (IX) Diastolic BP (X) Respiratory Rate

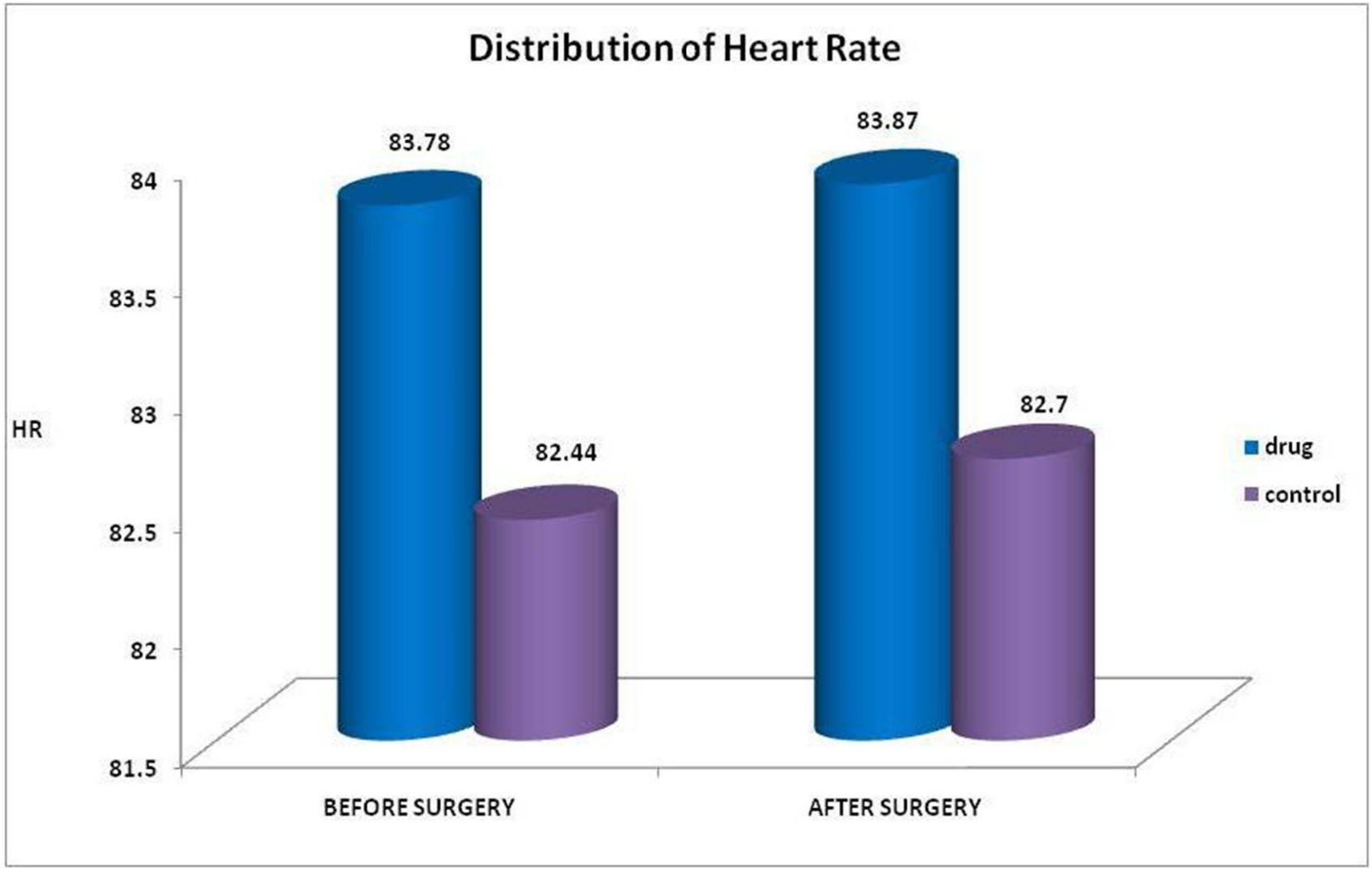
There was no statistically significant difference in the vital signs before and 2 hours after delivery in both the groups.

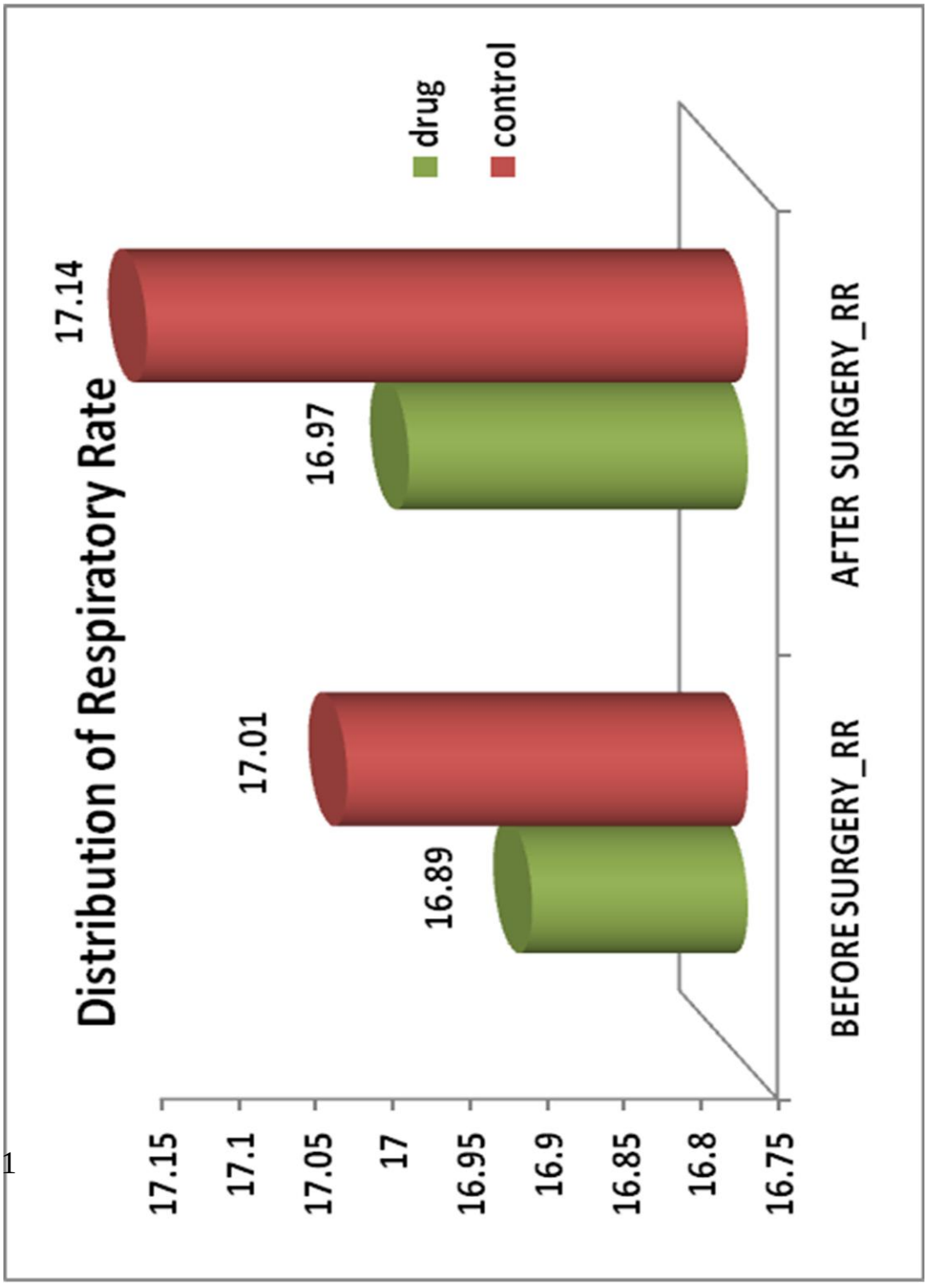
Table : 8 Comparison of Preop and Post Op Vital Parameters

Parameters	**Study Group**		**Control Group**		**'t' value**	**P value**
	Mean	**SD**	**Mean**	**SD**		
Pre Op Systolic BP	116.82	7.37	116.12	8.389	0.627	0.53
Post Op Systolic BP	115.24	6.933	114.26	9.006	0.862	0.39
Pre Op Diastolic BP	77.58	4.238	78.26	5.747	0.95	0.3
Post Op Diastolic BP	74.82	4.654	84.6	78.545	1.243	0.22
Pre Op Heart rate Rate	83.78	9.644	82.44	4.854	1.241	0.22
Post Op Heart Rate	83.87	8.442	82.7	5	1.192	0.24
Pre Op Respiratory Rate	16.89	0.777	17.01	0.759	1.105	0.27
Post Op Respiratory Rate	16.97	0.703	17.14	0.682	1.736	0.08


Distribution of Systolic BP
116.82
116.12
115.24
114.26
117
116.5
116
115.5
115
114.5
114
113.5
113
112.5
mmHg
drug
control
BEFORE SURGERY
AFTER SURGERY

Distribution of Diastolic BP
84.6
74.82
78.26
77.58
drug
control
85
80
75
70
65
mmHg
BEFORE SURGERY
AFTER SURGERY


Distribution of Heart Rate
83.78
83.87
82.44
82.7
84
83.5
83
82.5
82
81.5
HR
drug
control
BEFORE SURGERY
AFTER SURGERY


Distribution of Respiratory Rate
drug
control
17.14
16.97
17.01
16.89
17.15
17.1
17.05
17
16.95
16.9
16.85
16.8
16.75
BEFORE SURGERY_RR
AFTER SURGERY_RR

1

(XI) Blood Loss during and following Cesarean Section

The following Table shows the Blood Loss. Mean blood loss from time of placental delivery to completion of skin closure was 266.4 ml in the Study Group and it was 380.8 ml in the Control Group (P= 0.00), suggesting that there was statistically highly significant difference in blood loss in both the groups.

Patients who had received tranexamic acid had 114.4 ml less blood loss than patients who did not receive tranexamic acid.

Mean blood loss from time of completion of skin closure to 2 hours postpartum was 40.93 ml in the Study Group and it was 73.7 ml in the Control Group (P= 0.00), suggesting that there was statistically highly significant difference in blood loss in both the groups.

Patients who received tranexamic acid had 32.77 ml less blood loss than patients who did not receive tranexamic acid.

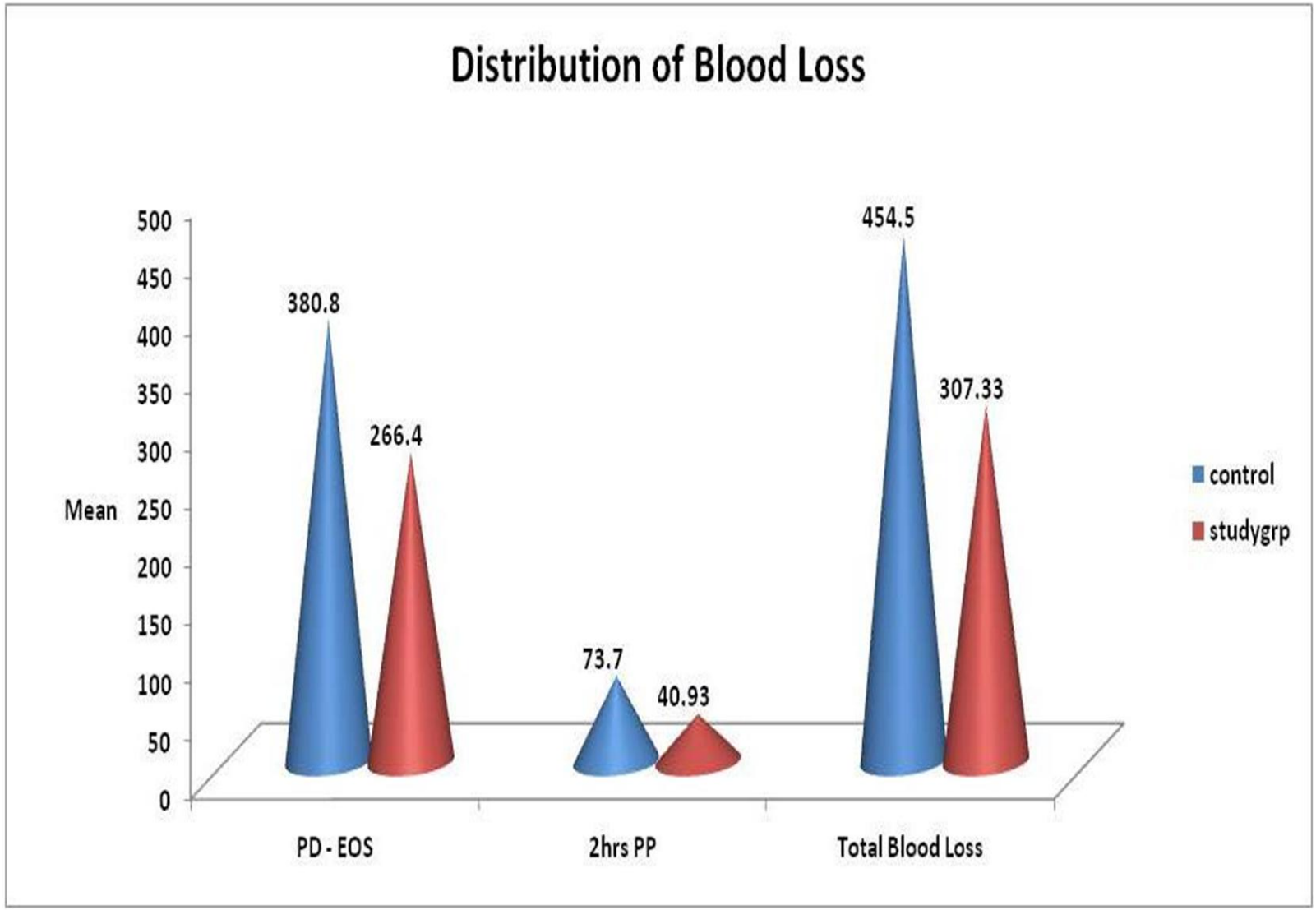
Mean total blood loss from placental delivery to 2 hours postpartum was 307.33 ml in the Study Group and it was 454.5 ml in the Control Group (p=0.00) suggesting that there was statistically highly significant difference in blood loss in both the groups.

Patients who received tranexamic acid had 147.17 ml less blood loss than patients who did not receive tranexamic acid.

Hence from the above result it is obvious that tranexamic acid is a potent antifibrinolytic drug that influences the blood loss in cesaerean section and its therapeutic efficacy can be used in minimizing caesarean section blood loss.

Table : 9 Comparison of Blood Loss

Blood Loss	Study Group		Control Group		't' value	P value
	Mean	SD	Mean	SD		
Placental delivery to completion of skin closure	266.4	54.46	380.8	75.62	12.275	0.00
Time of completion of skin closure to 2 hours postpartum	40.93	8.3	73.7	16.81	17.47	0.00
Total Blood Loss	307.33	58.86	454.5	82.74	14.49	0.00

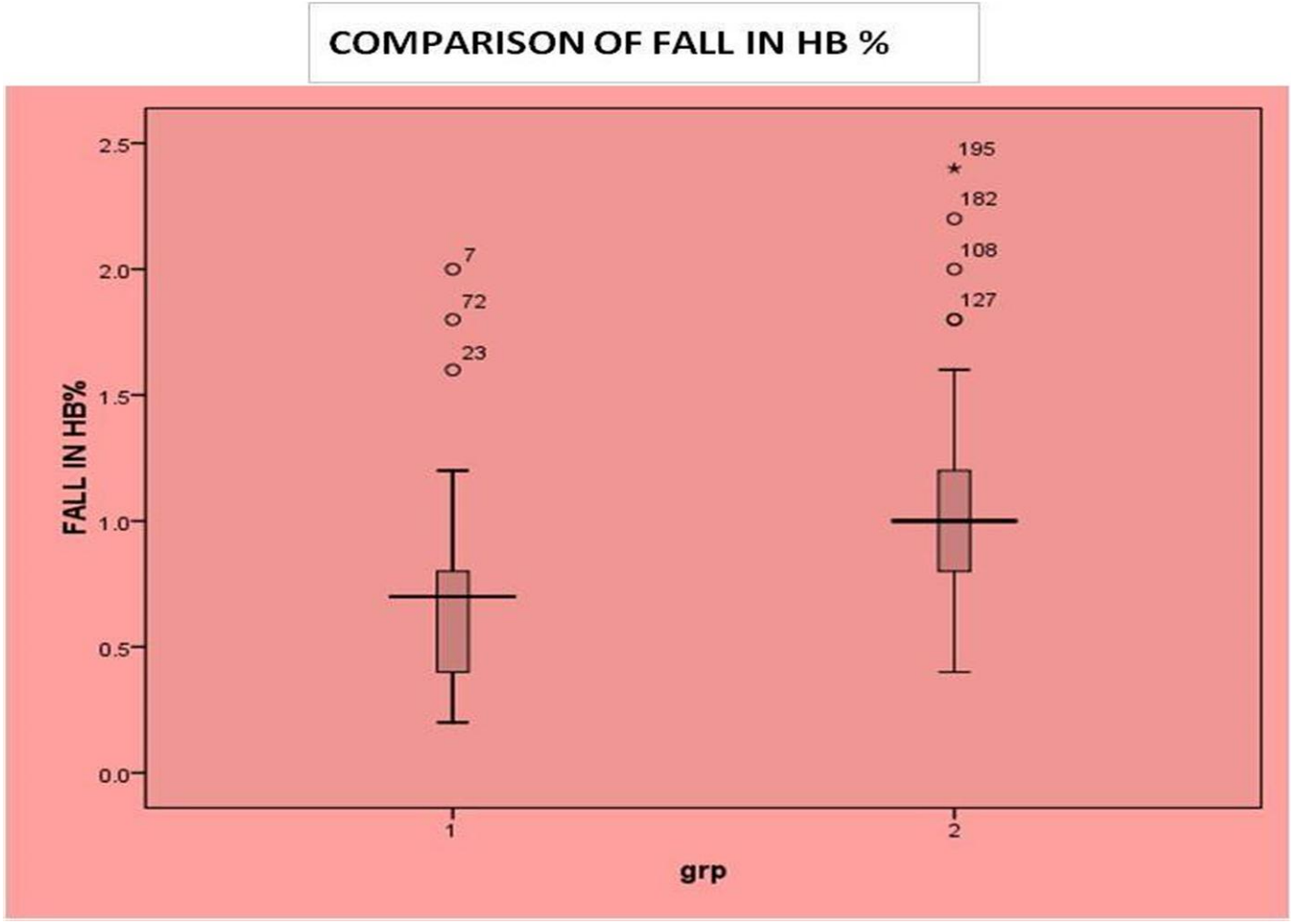

Distribution of Blood Loss
500
450
400
350
300
250
200
150
100
50
0
Mean
380.8
266.4
73.7
40.93
454.5
307.33
control
studygrp
PD - EOS
2hrs PP
Total Blood Loss

(XII) Fall in Hb %

Preoperative Hb% was compared to Hb% in 3rd postoperative day in both study and control group. There was a fall of 0.74gm% in study group while the fall in control group was much higher at 1.02 gm%. The mean difference is 0.28 gm% which is highly significant (P=0.001)

Table : 10 Comparison of Fall In HB

Hb%(gms%)	Study Group (1)		Control Group (2)		't' value	P value
	Mean	SD	Mean	SD		
Pre operative	10.358	0.596	10.6	0.6	5.183	0.001(S)
Postoperative	9.61	0.516	9.63	0.778		
Fall in hemoglobin	0.74	0.3288	1.02	0.384		

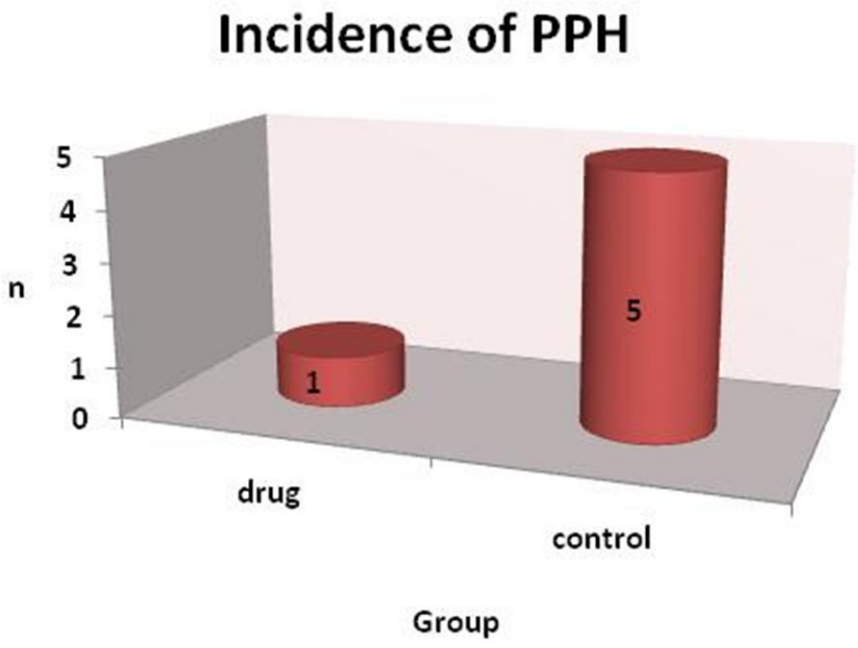

COMPARISON OF FALL IN HB %
FALL IN HB%
2.5
2.0
1.5
1.0
0.5
0.0
195
182
108
127
7
72
23
1
2
grp

(XIII) Incidence of PPH

The following Table shows the comparison of incidence of PPH (defined as loss > 500ml) in both groups. We find that in study group 1 patient had a PPH. In Control Group 7 patients had PPH. Statistically this is significant as per Chi Square test, but not significant as per Yates Correction.

Table :11 Incidence Of PPH

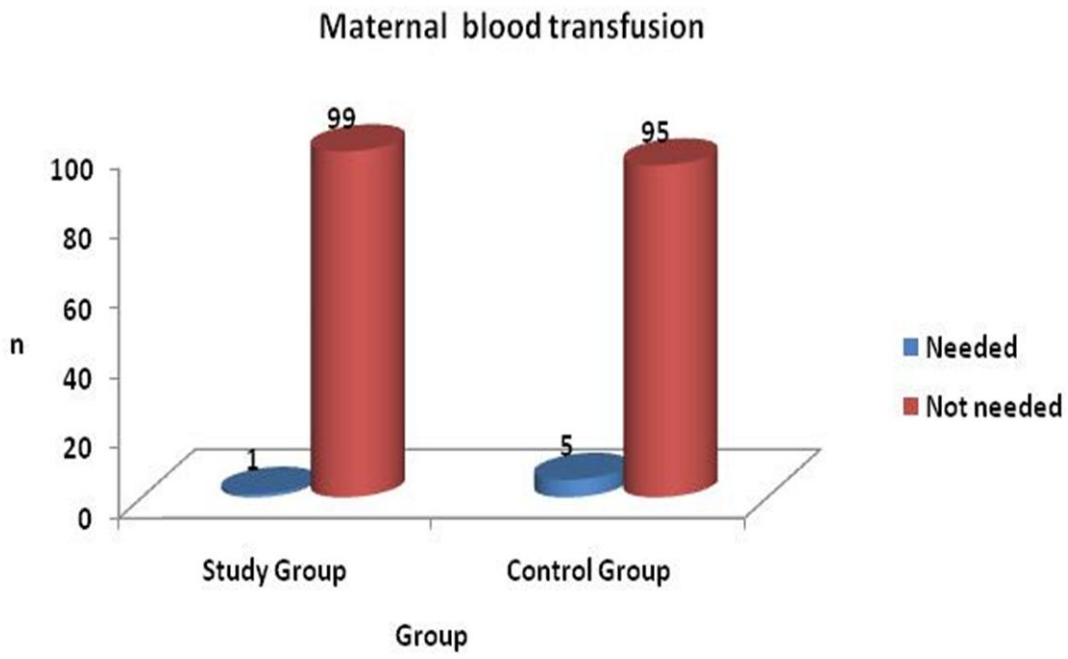
PPH : Blood loss >500 ml	Study Group	Control Group	Chi square TEST	P VALUE
Present	1	7	3.26	0.07 (NS)
Absent	99	93		



(XIV) Need of Maternal Blood Transfusion

Table :12 Comparison Of Need For Maternal Transfusion				
Maternal blood transfusion	**Study Group**	**Control Group**	**Chi square test**	**P value**
Needed	1	5	2.75	0.11(NS)
Not needed	99	95		

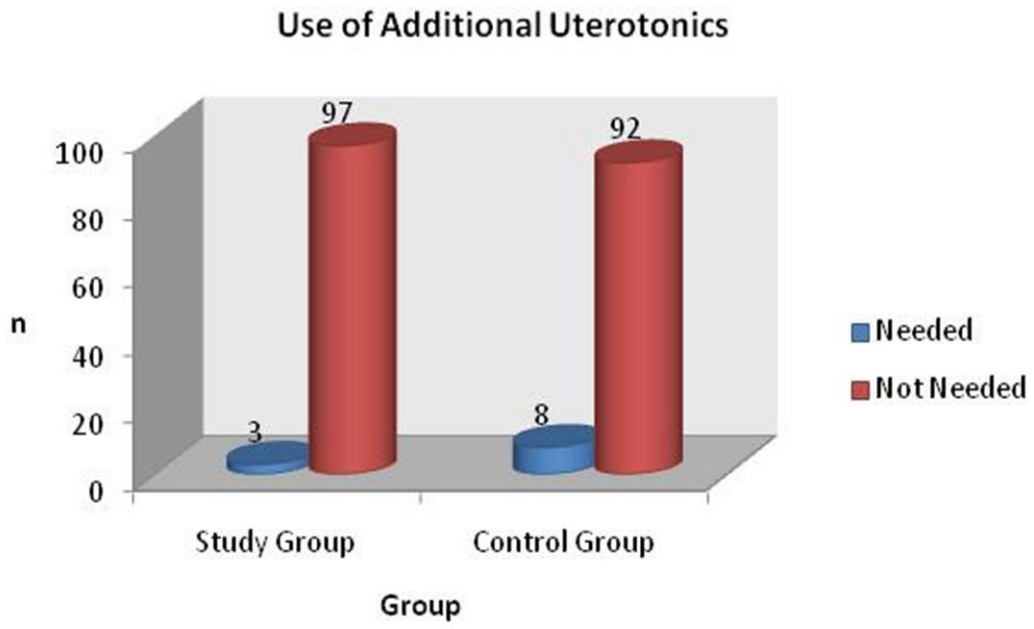
Table shows the need of maternal blood transfusion in both groups. In TXA group 1 patient had a blood transfusion whereas in Control Group 5 patients had blood transfusion .The difference was found to be not statistically significant.(p=0.11)



(XV) Use of Additional Uterotonics

Table :13 Comparison of Need of Additional Uterotonics				
Use of Additional Uterotonics	**Study Group**	**Control Group**	**Chi square**	**P value**
Needed	3	8	2.4	0.11(NS)
Not Needed	97	92		

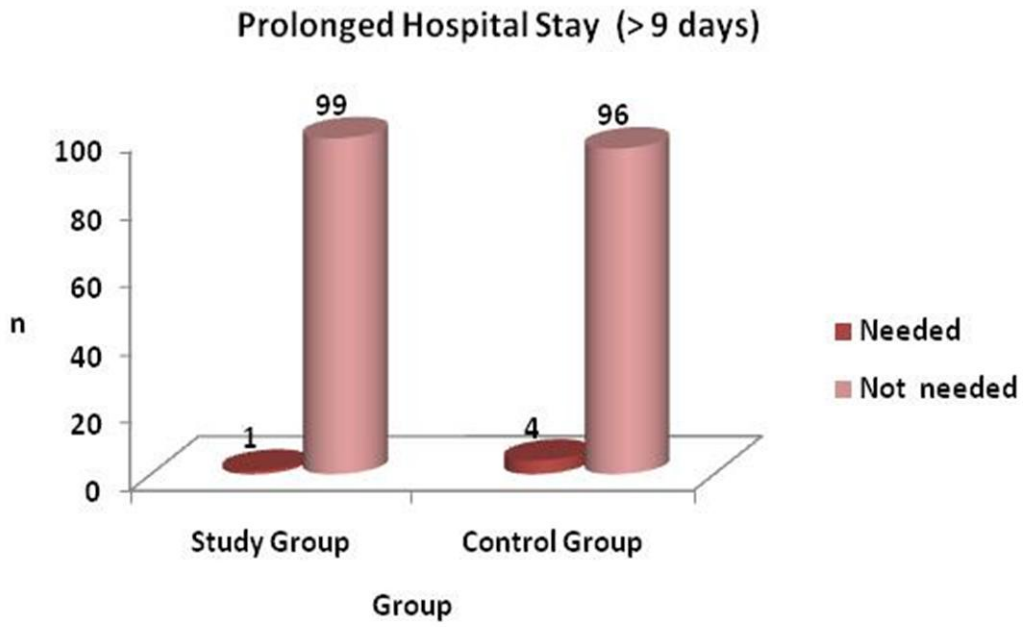
Table shows the need for additional uterotonics between two groups. In TXA group 3 patients needed additional uterotonics but in control group 8 patients needed additional uterotonics.But there found to be no statistical significance (p=0.11)



(XVI) Prolonged Hospital Stay

Table :14 Comparison of Prolonged Hospital Stay				
Prolonged Hospital Stay >9 days	**Study Group**	**Control Group**	**Chi square test**	**P value**
Needed	1	4	1.84	0.18 (NS)
Not needed	99	96		

Table shows comparison of hospital stay between study (TXA) group and control group. 1 patient in study group and 4 patients in control group had prolonged stay. There is no statistical significance between two groups .(p=0.18)

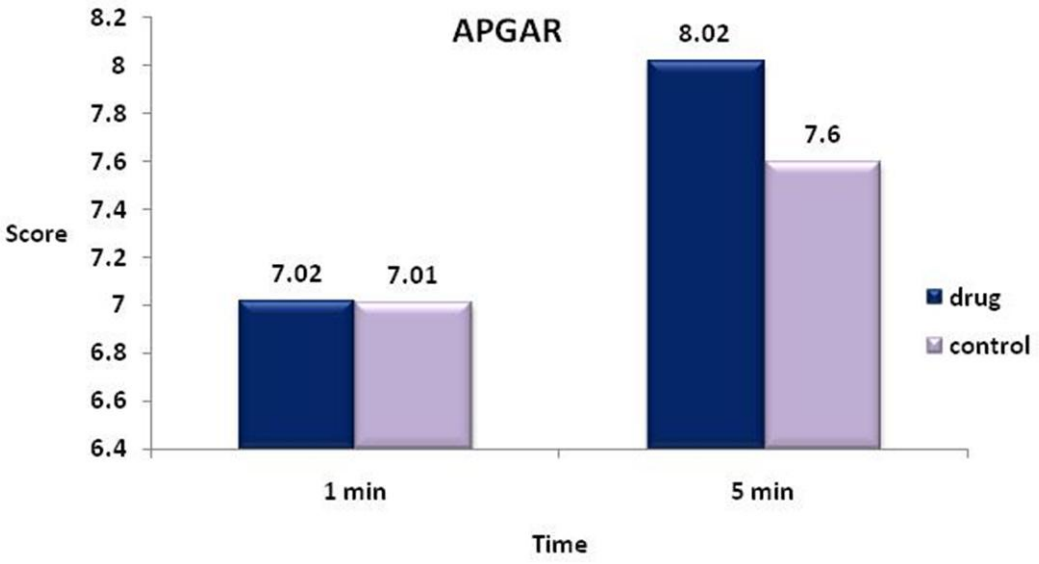


(XVII) APGAR

Comparison of (XVII) Apgar between study and control groups at 1 and 5 minutes showed Study Group had mean Apgar score of 7.02 at 1min & 8.02 at 5 min, while newborns born to subjects in Control Group had mean Apgar score of 7.01 at 1 min &7.6 at 5 min. There was no statistically significant difference in Apgar score in both the groups. (Mean and Median are same at 1 min & at 5 min in both groups).

Table: 15 Comparison of Apgar at 1 and 5 minutes

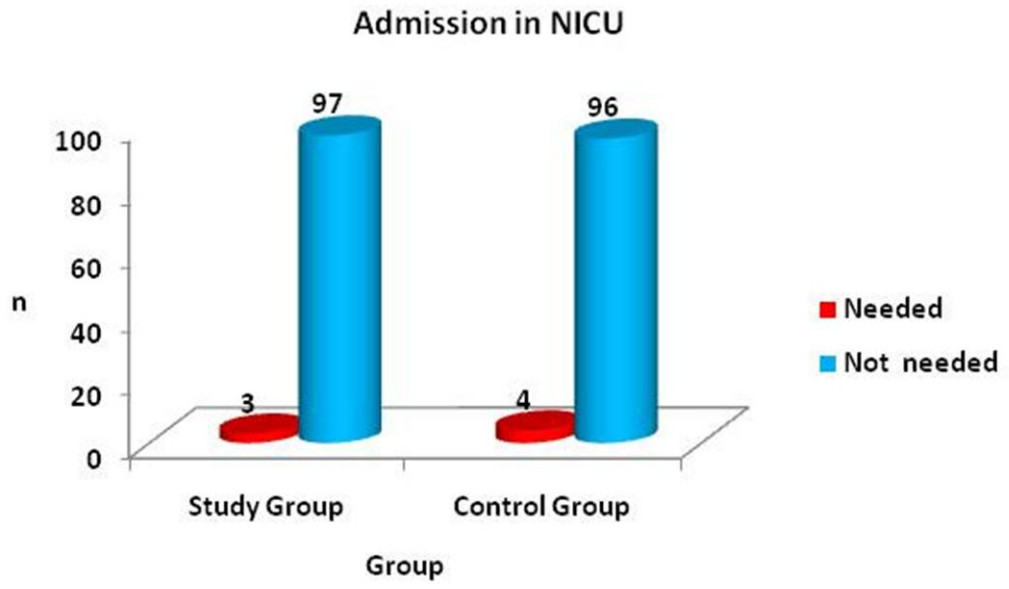
APGAR Score	Study Group		Control Group	
	Mean	Median	Mean	Median
At 1 Minutes	7.02	7	7.01	7
At 5 Minutes	8.02	8	7.6	8



(XVIII) Admission Rate in NICU

Table:16 Comparison of Admission In NICU				
Admission in NICU	**Study Group**	**Control Group**	**Chi square test**	**P value**
Needed	3	4	0.15	0.5 (Not significant)
Not needed	97	96		

Table shows need for NICU admission in both groups. 3 babies in study group and 4 babies in control group admitted in NICU but has no statistically significant difference in both groups. Thus, tranexamic acid has no significant difference in relation to fetal outcome.

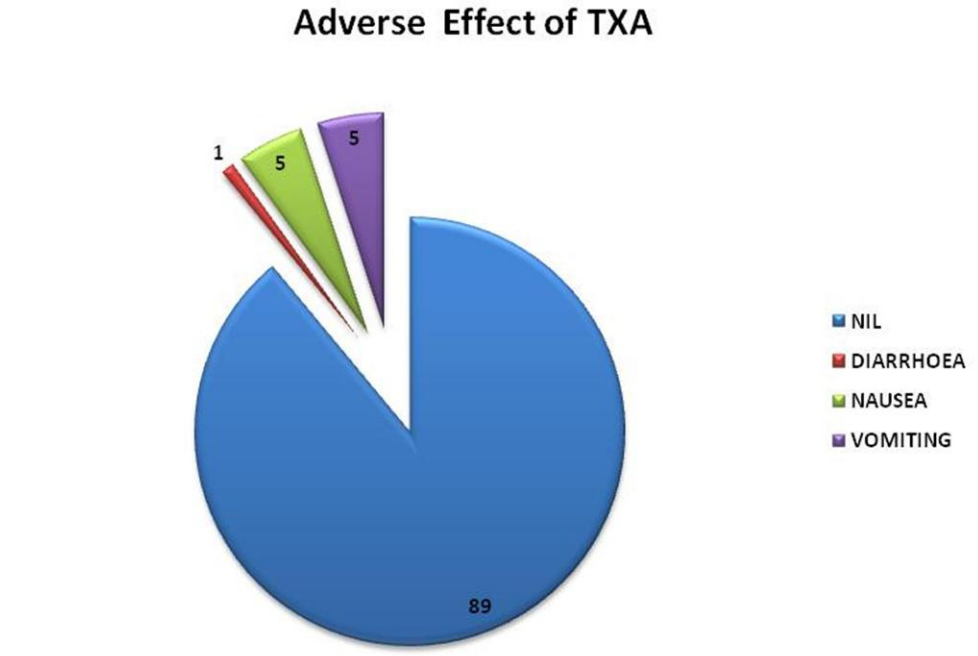


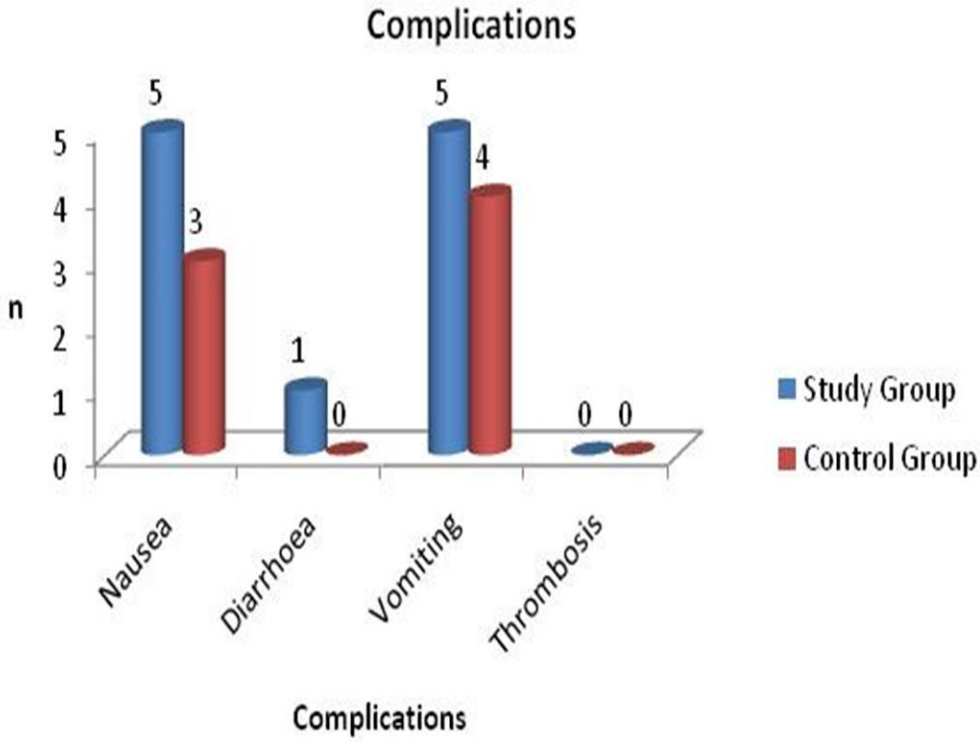
Incidence of (XIX) Nausea, (XX) Vomiting, (XXI) Diarrhea, (XXII) Thrombosis

Table :17 comparison of incidence of vomiting, nausea, diarrhoea, thrombosis		
Complications	**Study Group**	**Control Group**
Nausea	5	3
Diarrhoea	1	0
Vomiting	5	4
Thrombosis	0	0
Total	**11**	**7**

Table shows that 5 patients in study group and 3 patients in Control Group had nausea.5 patients in Study Group and 4 in control group had vomiting.1 patient in study group and none in control group had vomiting. None of the patients in study and control group had thrombosis.

The incidence of drug side effects like Nausea, vomiting , diarrhoea were not increased in study group as compared to control group. Thus suggesting that the use of Tranexamic acid had no significant adverse reactions.Also there was no incidence of thrombosis in TXA group.


Adverse Effect of TXA
1
5
5
89
NIL
DIARRHOEA
NAUSEA
VOMITING


Complications
n
0
1
2
3
4
5
5
3
1
0
5
4
0
0
Nausea
Diarrhoea
Vomiting
Thrombosis
Study Group
Control Group
Complications

ANALYSIS AND DISCUSSION

(I) AGE, (II) BMI:

In our study patients in both Study Group and control group were matched with no significant difference.

Similar to Amr H .Yehia et al[53]study in which the two studied groups were matched with no significant difference between the study and control groups regarding the variables mean age, body mass index (BMI) and gestational age. In this study the mean age in TXA group was (28.4±4.9 vs 28.6±4.7) in placebo group. Mean BMI was (22±1.6 vs 27.5±2.0) in TXA Vs placebo group respectively.

Other studies like Ayesha et al[54] the two study groups were matched with no significant difference in Age, BMI and Gestational age. In this study the mean age in TXA group vs control group was 24.18±3.93 vs 24.89 ±4.16 with(p=0.45).

(III) PARITY

In this study Primi and second gravida with full term singleton pregnancy delivered by elective / emergency LSCS were included in our study subjects with medical problems and with increased risk of developing PPH were excluded in this study which is similar to a study conducted at Karachi in 2013 by Ayesha et al.

Other similar studies comparable were Mayur et al[55](2004), ayesha et al (2009-11) H Yehia et a(l2014)

(IV) Indication for Cesarean Section

It can have a bearing on amount of blood loss. They were matched adequately in both groups and thus removed the effects of these confounding variables in our study. Similar to this study was conducted by Mayur et al with no statistical significance difference in indication for LSCS.

(V) Duration of Cesarean Section

The duration of surgery can alter the amount of blood loss and vital parameters In this study the duration study in study & control group were (43.12±2.337 Vs 42.61±2.562 min respectively with P value 0.10 (NS).This is comparable to other studies like Ayesha et al where the mean duration of LSCS was 47.5 min.

Mayur et al study, the difference in the duration of surgery between two Groups were not statistically significant (47.75 min Vs 48.57min in study & control group respectively).These results were comparable to our study.

(VI) Birth weight of Baby

The mean baby weight in our study was found to be 3.2382 ± 2.52Vs 2.987±0.42 with p=0.33 in study group and control respectively.

The difference was statistically not significant. Similar results were found in Mayur et al study, there was no difference in mean weight birth weight between two groups.

Pre Op and Post Op Vital Parameters : (VII) Heart Rate (VIII) Systolic BP (IX) Diastolic BP (X) Respiratory Rate

In our study there was no statistically significant difference in heart rate, systolic and diastolic blood pressure, respiratory rate between two groups. These results were similar to study conducted by Mayur et al, Ayesha et al and Amr H.yehia et al.

(XI) Blood Loss during and following Cesarean Section

Our study showed that Tranexamic acid has significantly reduces the bleeding during both the periods that is from the time of placental delivery during caesarean section to end of skin closure(266.4±54.46 V s380.8±75.62) and from end of skin closure to 2 hours postpartum period(40.93±8.3Vs73.7±16.81).Results showed that the mean total blood loss in study group who received tranexamic acid was 307.33ml±58.86 as standard deviation, while in control group patients had mean loss of 454.50ml ±82.74 as standard deviation. Thus there was a reduction is blood loss by about 147.17ml and was found to be statistically highly significant (p=0.001).

Similar study was conducted by Cemal ark, Gokhan,Gungorok[56] and coworkers. They performed a randomized, double-blind, placebo-controlled study of 660 women who underwent elective CS. The patients were randomly selected to receive an intravenous infusion of either TXA (1 g/10mL in 20 ml of 5% glucose; n=330) or 30 ml 5% glucose prior to surgery. The primary outcome was the estimated blood loss following CS. No demographic difference was observed between groups.The mean estimated blood loss was significantly lower in women treated with TXA compared with women in the placebo group(499.9±206.4 ml versus 600.7±215.7 ml respectively; $p<0.001$).

Sekhavat et.al (2009)[58] conducted a prospective randomized trial on 90 primiparas who underwent CS and grouped them in 2 groups. In study group there were 45 women, received tranexamic acid immediately before CS, whereas the control group, 45 women received placebo. Blood loss volume was measured from the end of CS to 2 hrs postpartum and compared between the two groups. Their results showed that tranexamic acid significantly reduced the blood loss from the end of CS to 2 hrs postpartum; 28.02 ± 5.53 ml in the tranexamic group versus 37.12 ± 8.97 ml in the control group ($p = 0.001$).

Amr H .Yehia et al (2014)calculated blood loss from placental delivery till end of surgery in study &control group (369.5±198.0 versus 606.8±193.0 ml, respectively), also calculated vaginal bleeding during first 6 hours post-operative period was significantly less in study group

compared to control (85.0 ±30.7 versus 130.8 ±49.3 ml, respectively), and calculated total blood loss from placental delivery till 6 hours post-operative was significantly less in study group compared to control (454.5± 201.0 versus 737.6 ±217.0 ml, respectively).

Also few other studies like Gaimy et al[57],Gohel et al ,Gungorduk and colleagues study ,xu et al also shown similar results like our study. But one study by Ayesha et al should there was significant reduction in preoperative blood loss in TXA group than placebo group (356.44±143.2ml Vs 710.22ml ±216.72ml) with p<0.001.it reduced the 2 hrs postpartum blood loss but not to significant level (35.68±23.39 l versus 43.63± 28.04) (p=0.188).

(XII) Fall in Hb %

In our there was significant fall of postoperative Hb% level in control group when compared to study group (1.02 Vs 0.74 with "t " test value of 5.183 with significant p value=0.001

Abdelazim et al (2014) There was no significant difference regarding pre-operative hemoglobin value was found, but the 24 hours post-operative hemoglobin was significantly higher in study group (11.2± 1.5 mg/dl) compared to control group (9.6 ± 1.2 mg/dl (P<0.05)

Similar reports were seen in a study by sekavat et al – Hb% 24 h after CS was significantly greater in tranexamic group than control group

(12.57 ± 1.33 in the tranexamic group and 11.74 ± 1.14 in the control group, p= 0.002). No complications or side effects were reported in either group. Other studies like Mayur et al ,Ayesha et al also had similar results like our study

(XIII) Incidence of PPH

Tranexamic acid also found to decrease the incidence of PPH i.e. the blood loss more than 500ml in the study group when compared control group. In this study only 1 patient had PPH and in control group 5 patient had PPH with P= 0. 07 but without statistical significance.

Yang HX, et al[59]showed similar results. Tranexamic acid significantly reduced postpartum blood loss after vaginal delivery. The occurrence of postpartum hemorrhage was 6.4% in study group as compared to 25.3% in control group, which was statistically significant. There were no significant adverse effects. Therefore, tranexamic acid is efficient & safe in reducing postpartum hemorrhage.

In Ayesha et al study also similar result were seen. This study also showed reduction in the incidence of postpartum hemorrhage to 13% from 30% in TXA group as compared to placebo. Amr H.Yehia et al also showed in their study that the incidence of PPH was significantly less in study group who received TXA when compared to control group(31.1% versus 63.2% respectively)

(XIV) Need of Maternal Blood Transfusion

In this study only one patient in Study Group had blood transfusion. In control group 5 patients had blood transfusion. But without statistical significance.

In Ayesha et al study also similar results were seen , study on 74 full term pregnant women delivered by LSCS, where 12 patients from the placebo group required the blood transfusions while 3 patients in the Study Group required transfusion.

In Amr H.Yehia et al study no blood transfusion was needed in study group while two in control group had blood transfusion but the difference was not statistically significant. These results were similar to our study.

(XV) Use of Additional Uterotonics

In our study additional uterotonics were needed more in control group than study group. only 3 in study group were received additional uterotonics when compared to control group where 8 patients received additional uterotonics.

Cemal ark eta al:Study on 660 women undergoing elective caesarean section found that the proportion of women in the TXA group with PPH was significantly lower than in the placebo group (7 [2.1%] versus 19 [5.8%], respectively, with relative risk [RR] 2.7; 95%

confidence interval [CI] 1.1 to 6.3; p<0.03). Furthermore, more women in the placebo group than in the Study Group required additional uterotonic agents (48 [14.5%] versus 28 [8.5%], respectively; RR 1.7; 95% CI 1.1 to 2.6; p=0.02).these results were similar to our study.

(XVI) Prolonged Hospital Stay

In our study one mother in study group and 4 mothers in controlled group had prolonged hospital stay but without statistically significant difference(p=0.18). One mother in study group had prolonged stay as the baby had low birth weight and HMD had NICU care. She discharged on 11 th POD.

4 mothers in control group had prolonged hospital stay ,among them one had breast engorgement and fever and another one for baby sake as two babies were low birth weight and neonatal jaundice and were admitted in NICU care ,one had wound infection and fever and treated with appropriate antibiotics after pus culture sensitivity.

Similar to this result in Gurunanak et al the prolonged hospital stay was statistically significant in both study and control groups (2.0±0.1 Vs 2.0±0.0)respectively with P=0.10 (NS)

(XVII) APGAR

In our study 1 and 5 minutes mean Apgar score were found to be 7.02&8.02 Vs 7.01 &8.67 with no statistically significant difference.

Similar results were seen in Mayur et al study where they found that Tranexamic acid had no significant effect on 1 & 5 minutes Apgar score between two groups with(P=0.5). Others studies like Ayesha et al,Amr H.yehia et al also showed similar results as in our study.

(XVIII) Admission Rate in NICU

In our study ,the neonatal outcome were comparable in both study and control groups.3 babies had NICU admission. one admitted for neonatal jaundice and the indication for LSCS was severe oligohydromnios and had phototherapy and discharged on 3th POD. Another baby was low birth weight and HMD. The indication for caesarean section was severe oligohydromnios and discharged on 10th POD.

Another had TTN and the indication for LSCS was fetal distress. Baby was admitted in NICU and discharged on 4th POD. In control group 4 babies were admitted in NICU. Among them one had HIE and the indication for LSCS was fetal distress. Treated and discharged on 5th POD.2 Babies were low birth weight and the indications for LSCS were PL/PROM and the other for flexed breech. Both were discharged in good health on 11th POD. Another baby had neonatal jaundice, admitted in NICU and discharged in good condition on 4th POD.

This shows that TXA was not associated with any impact on neonatal outcome in our study. similar results were seen in a study

conducted by Abdelazim ,Amr H.Yehia and coworkers at in Department of Obstetrics & Gynaecology, Ain Shams university ,Cairo ,Karachi, there was no adverse neonatal outcome in their study.

Incidence of (XIX) Nausea, (XX) Vomiting, (XXI) Diarrhea, (XXII) Thrombosis

In this study, the incidence of the drug side effects like Nausea,vomiting,diarhhoea were not statistically significant increase in study group when compared to control group.

Out of the 5 patients in the study group one patient recieved additional uterotonics like 2nd dose inj.prostadin(PG F2 α)& inj. oxytocin, Tab. Misoprostol and 4 did not receive any other drugs. Similarly out of 4 patients with vomiting in the control group only one patient received additional uterotonics for PPH and 3 did not.

Excluding the administration of additional uterotonics as a cause of vomiting,the incidence of vomiting otherwise is almost similar in both groups without any statistically significant difference. All the patients received parentral antibiotics just prior to surgery & the emetogenic effect of antibiotics in causing vomiting was considered and same in both groups.

Pregnancy is an hypercoagulable state and the incidence of thrombosis during pregnancy and puerperium is 5-6 times higher than

that in the general population.So when the anti fibrinolytic drug tranexamic acid is administered, the increased risk of thrombosis should be considered, especially in the LSCS postpartum population. In our study, not a single patient developed thrombotic events.

Senturk & colleagues Study Group didn't observe any complications caused by TXA such as venous thromboembolism, gastrointestinal problems and hypersensitivity .

Also, Mayur et al, concluded in their study that not even a single patient in Study Group developed thrombosis and the incidence of side effects like nausea,vomiting and diarrhoea were found to be not statistically significant by difference in both groups. These results were corroborated by Yang H et al, Lindoff C et al[60], Gai MY et al.

Limitations of our Study

There are few limitations in our study

- Blood Loss from Skin Incision till delivery of Placenta is not included in our study
- High Risk Population for PPH was is not included in this study

CONCLUSION

- There is no significant difference in Age, BMI, Parity, Indication and Duration of Cesarean Section and Birth weight of Baby between the study group and control group. Both Groups are comparable.

- Intravenous infusion of Tranexemic Acid at the dose of 15 mg/Kg Body Weight, initiated 15 minutes prior to Skin Incision

    - does not alter the (1) Heart rate, (2) Systolic BP, (3) Diastolic BP and (4) Respiratory Rate

    - leads to significant reduction ($p < 0.05$) in Per Operative (average 114.40 ml) and Post Operative Blood Loss (average 32.77 ml) during Cesarean Section. Total Blood Loss is reduced by an average of 147 ml.

    - leads to significant ($p < 0.05$) difference in fall of Hb level in control group who have not received inj.Tranexamic acid. The mean difference was 0.28gms%(P=0.01)

    - leads to Reduction in (1) the incidence of PPH, (2) need for maternal blood Transfusion, (3) Use of additional Uterotonics, (4) Duration of stay in an insignificant manner

- does not alter the APGAR Score and Rate of admission into NICU, in a significant manner.
- does not produce other adverse reactions like nausea, vomiting, diarrhea in a significant manner. It was not associated with thrombotic complications.

- Intravenous infusion of Tranexemic Acid at the dose of 15 mg/Kg Body Weight, initiated 15 minutes prior to Skin Incision is effective and safe in women undergoing caesarean section in reducing preoperative and postoperative cesarean section blood loss .

BIBLIOGRAPHY

1. HISTORY-Boley,J.P., " The History of Cesarean section" , Canadian Medical Association Journals ,Vol.145,No.4,1991,p 319-322

2. World Health Organization. Appropriate technology for birth. Lancet 1985; 2:436-437

3. Sufang G, S Padmadas, Z Fengmin, J Brown and R W Stones (2007). Delivery settings and caesarean section rates in China, Bulletin of the World Health Organization, 85 (10).

4. Potter J E, E Berquó, I Perpétuo, L F Ondina, K Hopkins, R S Marta, C Maria (2001). Unwanted caesarean sections among public and private patients in Brazil: prospective study, British Medical Journal, 323 (17).

5. Sources: The Millennium Development Goals Report 2013, United Nations, 2013; UNDP, UNFPA; UNICEF; UN Women; WHO.

6. Merck & Co. Merck Manual Online: overview of hemostasis. Available from URL:www.merckmanuals.com/ professional/ hematology_and_oncology/hemostasis/overview_of_hemostasis.html [Accessed 2014 Aug 23]

7. Murphy GJ, Reeves BC, Rogers CA, Rizvi SI, Culliford L, Angelini GD. Increased mortality, postoperative morbidity, and

cost after red blood cell transfusion in patients having cardiac surgery.[see comment]. Circulation. 2007; 116(22): 2544-2552.

8. Kamilya G ,Seal SL ,Mukherji J,Hazra A .Maternal mortality and caesarean delivery ,an analytical observational study.J obstet Gynaecol Res 2010 Apr;36(2);248-53

9. Bruinse HW, Kwee A, Bots ML .Emergency perpartum hysterectomy; A prospective study in Netherlands.Eur J Obstet Gynecol Reprod Biol 2006 Feb1;124(2);187-92,

10. Gurbuz B, Yildirim G,Ozden S ,Analysis of 59 cases of emergent peripartum hysterectomies during a 13 year period.Arch Gynecol Obstet 2005 ;Apr;271(4); 363-367.

11. Fergusson DA, He´ bert PC, Mazer CD, et al. A comparison of aprotinin and lysine analogues in high-risk cardiac surgery. N Engl J Med 2008 May 29; 358 (22):2319-31.

12. Dunn CJ, Goa KL. Tranexamic acid: a review of its use in surgery and other indications. Drugs 1999 Jun; 57 (6):1005-32.

13. Pfizer. Cyklokapron (tranexamic acid injection): US prescribing information [online].Available URL: http://labeling.pfizer.com/ ShowLabeling.aspx?id=556.

14. WHO EML – Draft Report – Tranexamic Acid – November 2008,P 16 -19.

15. Caims J, Guerriero C, Perel P ,et al.cost effectiveness analysis of administrating tramexamic acid to bleeding trauma patients using evidence from crash–2 trial. plos one 2011; 6(5):e 18987.

16. Koch CG, Li L, Duncan AI, Mihaljevic T, Cosgrove DM, Loop FD et al. Morbidity and mortality risk associated with red blood cell and blood-component transfusion in isolated coronary artery bypass grafting.[see comment]. Crit Care Med. 2006; 34(6): 1608-1616.

17. Svanberg L, Astedt B, Nilsson IM. Abruptio placentae treatment with the fibrinolytic inhibitor tranexamic acid was effective. Acta Obstet Gynaecol Scand 1980; 59:127-30.

18. Hagen P, Webb JB. Use of tranexamic acid in management of postpartum hemmorhage. Br J Obstet Gynaecol 1996 Dec;103:1250-1.

19. Ducloy-Bouthors A-S, Jude B, Duhamel A, et al. High-dose tranexamic acid reduces blood loss in postpartum

20. Gohel M, Purvi P, Ashoo G, Pankaj D et al Efficacy of tranexamic acid in reducing blood loss during and after the lower segment cesarean section.: A randomized case controlled prospective study. (Obstet Gynecol India.2007; 50. (3) ;228-230)

21. Gai MY, Wu LF ,Su QF et al. A clinical observation of blood loss reduced by tranexamic acid during and after caesarian section : a

multicentral trial, randomized trial science direct Eur J Obstet Gynecol

22. Reprod Biol. 2004;112:154 –haemorrhage. Crit Care 2011; 15 (2): R117.

23. Lukes AS, Moore KA, Muse KN, et al. Tranexamic acid treatment for heavy menstrual bleeding: a randomized controlled trial. Obstet Gynecol 2010 Oct; 116 (4): 865-75.

24. Rybo G, Westerberg H. The effect of tranexamic acid(AMCA) on postoperative bleeding after conization. ActaObstet Gynecol Scand 1972; 51 (4): 347-50.

25. Caglar GS, Tasci Y, Kayikcioglu F, et al. Intravenous tranexamic acid use in myomectomy: a prospective randomized double-blind placebo controlled study. Eur J Obstet Gynecol Reprod Biol 2008; 137 (2): 227-31.

26. Katsaros D, Petricevic M, Snow NJ, et al. Tranexamic acid reduces postbypass blood use: a double-blinded, prospective, randomized study of 210 patients. Ann Thorac Surg 1996; 61 (4): 1131-5.

27. Barer D, Ogilvie A, Henry D, et al. Cimetidine and tranexamic acid in the treatment of acute upper-gastrointestinal tract bleeding. N Engl J Med 1983 Jun 30; 308 (26):1571-5.

28. Stae¨ l von Holstein CCS, Eriksson SBS, Ka¨ lle´ n R. Tranexamic acid as an aid to reducing blood transfusion requirements in gastric and duodenal bleeding. Br Med J(Clin Res Ed) 1987 Jan 3; 294 (6563): 7-10.

29. CRASH-2 Trial Collaborators. Effects of tranexamic acid on death, vascular occlusive events, and blood transfusion in trauma patients with significant hemorrhage (CRASH-2):a randomized, placebo-controlled trial. Lancet 2010; 376(9734): 23-32.

30. Sadeghi M, Mehr-Aein A. Does a single bolus dose of tranexamic acid reduce blood loss and transfusion requirements during hip fracture surgery? A prospective randomized double blind study in 67 patients. Acta Med Iran 2007; 45 (6): 437-42.

31. Hiippala ST, Strid LJ, Wennerstrand MI, et al. Tranexamicacid radically decreases blood loss and transfusions associated with total knee arthroplasty. Anesth Analg 1997; 84(4): 839-44.

32. Countdown to 2015: Maternal, Newborn and Child Survival [Internet]. WHO and UNICEF, 2012 Availableat: http://www.countdown2015mnch.org/ documents/ 2012Report/ 2012-Complete.pdf. Last accessed 1 july 2014.

33. Trends in Maternal Mortality: 1990 to 2010. WHO, UNICEF, UNFPA and The World Bank estimates. Geneva, WHO, 2012.

Available at:http://whqlibdoc.who.int/ publications/ 2012/ 9789241503631_eng.pdf. Last accessed june 2014.

34. Sources: The Millennium Development Goals Report 2013, UnitedNations, 2013; UNDP, UNFPA; UNICEF; UN Women; WHO.

35. PATH. Postpartum hemorrhage prevention and treatment website. 2011. Available at:http://www.pphprevention.org/pph.php. Last accessed 11 March ,2014

36. WHO recommendations for the prevention and treatment of postpartum haemorrhage. Geneva, World Health Organization, 2012. Availableat: http://apps.who.int/ iris/bitstream/10665/ 75411/1/ 9789241548502_eng.pdf. Last accessed 6,june 2014.

37. Alexander J, Thomas P, Sanghera J. Treatments for secondary postpartum haemorrhage. Cochrane Database Syst Rev 2002;(1):CD002867.

38. American College of Gynecologists and Obstetricians. Quality Assurance in Obstetrics and Gynecology. Washington DC: American College of Obstetricians and Gynecologists,1989

39. Sobieszczyk S, Breborowicz GH. Management recommendations for postpartum hemorrhage. Arch Perinatal Med 2004;10:1–4

40. Benedetti T. Obstetric hemorrhage. In: Gabbe SG, Niebyl JR, Simpson JL, eds. A pocket Companion to Obstetrics, 4th edn. New York: Churchill Livingstone, 2002

41. Prata N, Mbaruku G, Campbell M. Using the Kanga to measure post partum blood loss. Int J Gynaecol Obstet 2005;89:49–50

42. Symptoms related to blood loss with postpartum hemorrhage.Adapted from Bonnar J. Baillieres Best Pract Res Clin Obstet Gynaecol 2000;14.

43. The caesaerean birth, Ranjit Akoleker obstetrician @ Gynaecologist ,Department of fetal mediciene,Mumbai,2010

44. The Joint Commission. (2010). Preventing maternal death. Sentinel Event Alert, 44, 1–4. Retrieved from http://www.jointcom-mission.org/assets/1/18/SEA_44.PDF

45. New York State Department of Health. (2009). Health advisory: Prevention of maternal deaths through improved management of hemorrhage. New York, NY: Author. Retrieved from http://www.poughkeepsiejournal.com/assets/pdf/ BK13600763.PDF

46. A., Goudar, S. S., Geller, S. E., Kodkany, B. S., Edlavitch, S.A., Wagh, K.Derman, R. J. (2006). Drape estimation vs. visual assessment for estimating postpartum hemorrhage. International Journal of Gynaecology & Obstetrics, 93(3),220-224

47. Patel, A., Goudar, S. S., Geller, S. E., Kodkany, B. S., Edlavitch, S.A., Wagh, K.,…Derman, R. J. (2006). Drape estimation vs. visual assessment for estimating postpartum hemorrhage. International Journal of Gynaecology & Obstetrics, 93(3), 220-224.

48. Duthie, S., Ven, D., Yung, (1990).Discrepancy between laboratory determination and visual estimation of blood loss during normal delivery. European Journal of Obstetrics & Gynecology Patel and Reproductive Biology, 38, 119-124.

49. Stafford, I., Dildy, G., Clark, S.,& Belfort, M. (2008).Visually estimated and calculated blood loss in vaginal and cesarean delivery. American Journal o ofObstetrics& Gynecology,199, 519.e1-519.e7. doi:10.1016/j.ajog.2008.04.049.

50. Anazi, B. K., & Tamim, H. M Alkadri. (2011). Visual estimation versus gravimetric measurement of postpartum blood loss: A prospective cohort study. Archives of Gynecology and Obstetrics, 283(6), 1207-1213

51. Dildy, G. A., 3rd, Paine, A. R., George, N. C., & Velasco, C. (2004). Estimating blood loss: Can teaching significantly improve visual estimation? Obstetrics & Gynecology, 104(3), 601-606

52. Gabel, K. T., & Weeber, T. A. (2012). Measuring and communicating blood loss during obstetric hemorrhage. Journal of Obstetric, Gynecologic, & Neonatal Nursing, 41(4), 551-558.

53. Clinical management guidelines for women's health and perinatal nurses, May 2014

54. Amr H,Yehia ,Abdelazim ;Asian pacific journel of Reproduction, AINS university ,Egypta randomized controlled trial of txa in reducing caesarean section blood loss;

55. Afshan et al and Ayessha khan et al; journel of the college of physicians and surgeons Pakistan 2013, vol.23 (7): 459-462

56. Mayur G, Purvi P, Ashoo G, Pankaj D. Efficacy of tranexamicacid in decreasing blood loss during and after caesarean section: a randomized case controlled prospective study. J ObstetGynecol India 2007; 57:227-30

57. Gungorduk K, Yıldırım G, Asıcıoglu O, Gungorduk OC,Sudolmus S, Ark C. Efficacy of intravenous tranexamic acid in reducing blood loss after elective caesarean section: a prospective, randomized, double-blind, placebo-controlled study. Am J Perinatol 2011; 28:233-40. Epub 2010 Oct 26.

58. Gai MY, Wu LF, Su QF, Tatsumoto K. Clinical observation ofblood loss reduced by tranexamic acid during and after caesarean section: a multi-center, randomized trial. Eur J ObstetGynecol Reprod Biol 2004; 112:154-7.

59. Sekhavat L, Tabatabaii A, Dalili M, Farajkhoda T, Tafti AD.Efficacy of tranexamic acid in reducing blood loss after

caesarean section. J Matern Fetal Neonatal Med 2009; 22:72-5.

60. Yang H, Zheng S, Shi C. Clinical study on the efficacy of tranexamic acid in reducing postpartum blood loss: a randomized, comparative, multicenter trial. Chin J Obstet Gynecol2001; 36: 590-2.

61. Lindoff C, Rybo G, Astedt B. Treatment with tranexamic acid during pregnancy & the risk of thromboembolic complications. Throm Haemost 1993 Aug 2; 70:238-40

62. Hudić I, Bujold E, Fatušić Z, Skokić F, Latifagić A, Kapidžić M, Fatušić J (2012). "The Misgav-Ladach method of cesarean section: a step forward in operative technique in obstetrics". Arch. Gynecol. Obstet. 286(5): 1141–6.

APPENDIX I
ETHICAL COMMITTEE APPROVAL

INSTITUTIONAL ETHICS COMMITTEE

CHENGALPATTU MEDICAL COLLEGE , CHENGALPATTU

APPROVAL OF ETHICAL COMMITTEE

To

Dr.D.Punitha Meenakshi
Post Graduate
Dept of O & G

Dear Dr.

The Institutional Ethical Committee of Chengalpattu Medical College reviewed and discussed your application to conduct the clinical / dissertation work entitled

EFFICACY OF PREOPERATIVE TRANAXEMIC ACID IN REDUCING CESAEREAN SECTION BLOOD LOSS

On 13.11.2013

The following documents reviewed

a. Trial protocol, dated _____version no
b. Patient information sheet and informed consent form in English and / or vernacular language.
c. Investigators Brochure, dated _____version
d. Principal Investigators current CV
e. Investigators undertaking

The following members of the Ethics committee were present at the meeting held on

Date 13.11.2013 Time 12.00 Noon Place Chengalpattu Medical College

Approved _____ Chairman Ethics Committee

_____ Member secretary of Ethics Committee.

Name of each member with designation

Clinical Members

1. Dr.G.Raja Billy Graham MS.,
   Prof & HOD of Surgery, CHMC

2. Dr.K.Srinivasagalu MD.,
   Prof & HOD of Medicine, CHMC

Biological Scientist

3. Dr.K.Baskaran MD.,
   Asso Prof of Pharmacology, CHMC

Non Clinical Members

4. Dr.P.Parasakthi MD
   Prof & HOD of Forensic Medicine,CHMC

5. Member from Nongovernmental
   Voluntary Organisation : Mr.P.Durairaj

6. Philosopher : Mr.K.S.Ramprasad

7. Lawyer : Lr. I. M. Karimala Basha

8. Layperson : Mr.Dilli

We approve the clinical trial to be conducted in its presented form

The Institutional Ethics Committee expects to be informed about the progress of the study and any SAE occurring in the course of the study, any changes in protocol and patient information / informed consent and asks to provide copy of final report.

Yours sincerely

13/11/13

Member secretary, Ethics Committee

APPENDIX II
COPY OF INFORMED CONSENT

<u>ஆராய்ச்சி ஒப்புதல் கடிதம்</u>

ஆராய்ச்சி தலைப்பு : "சிசேரியன் அறுவை சிகிச்சையின் போது இரத்தபோக்கினை குறைக்கும் மருந்து குறித்த ஆராய்ச்சி" பற்றிய ஆய்வு

பெயர் :

வயது : **பால் :** பெண் **தேதி :**

உள்நோயாளி எண் : **ஆராய்ச்சி சேர்க்கை எண் :**

- செங்கல்பட்டு அரசு மருத்துவக்கல்லூரி மற்றும் மருத்துவ மனையின் மகப்பேறு துறையில் "சிசேரியன் அறுவை சிகிச்சையின்
- போது இரத்தபோக்கினை குறைக்கும் மருந்து குறித்த ஆராய்ச்சி" பற்றிய ஆய்வு நடைபெறுகிறது என்பதை அறிந்து கொண்டேன்
- நோய் வரலாறு, உடல் நிலை, ஆய்வக முடிவுகள், இரத்தம் உறையும் தன்மை ஆகியவற்றின் அடிப்படையில் இந்த ஆய்வு நடைபெறுகிறது என்பதையும் மேலும் அறுவை சிகிச்சையின் போது நேரடியாக பார்க்கப்படுவதை வைத்தும் ஆய்வு நடைபெறுகிறது என்பதையும் அறிந்து கொண்டேன்

- இவ்வாய்வில் கலந்து கொள்பவர்களின் சொந்த தகவல்கள் ரகசியமாக பாதுக்காகபடும் என்பதையும் இந்த ஆய்வின் முடிவுகளை பிரசுரிக்குபோது அல்லது வெளியிடும்போதோ தங்களின் எனது தகவல்கள் ஏதும் வெளியிடபடாது என்பதையும் அறிந்து கொண்டேன்
- இந்த ஆராய்ச்சியிலிருந்து எந்த நேரமும் பின் வாங்கலாம் என்றும், அதனால் எந்த பாதிப்பும் எற்படாது என்பதையும் அறிந்து கொண்டேன்
- இந்த ஆய்வில் பங்குபெற அல்லது விலகிக்கொள்ள எனக்கு முழு சுதந்திரம் உண்டு என்பதையும், இந்த ஆய்வில் இருந்து நான் விலகிகொண்டாலும் எனக்கு கிடைக்கவேண்டிய சிகிச்சை தொடர்ந்து கிடைக்கும் என்பதையும் அறிந்து கொண்டேன்
- இந்த ஆராய்ச்சியின் விவரங்களும், அதன் நோக்கங்களும் எனக்கு தெளிவாக விளக்கப்பட்டது. எனக்கு விளக்கப்பட்ட விவரங்களை புரிந்து கொண்டு, இந்த ஆய்வில் கலந்து கொள்ள சம்மதிக்கிறேன்
- இந்த ஆராய்ச்சியில் பிறரின் நிர்பந்தமின்றி என் சொந்த விருப்பத்தின் பேரில் தான் பங்கு பெறுகிறேன்.

கையொப்பம்

APPENDIX III
COPY OF PATIENT INFORMATION SHEET

<u>ஆராய்ச்சித் தகவல் தாள்</u>

- இரத்த போக்கை குறைக்கும் மருந்து குறித்த ஆராய்ச்சியில் தாங்கள் பங்குபெறுகிறீர்கள்.
- செங்கல்பட்டு அரசு மருத்துவக்கல்லூரி மற்றும் மருத்துவ மனையின் மகப்பேறு துறையில் ஆய்வு நடைபெறுகிறது
- தங்களின் நோய் வரலாறு, உடல் நிலை, ஆய்வக முடிவுகள், இரத்தம் உறையும் தன்மை ஆகியவற்றின் அடிப்படையில் இந்த ஆய்வு நடைபெறுகிறது
- மேலும் அறுவை சிகிச்சையின் போது நேரடியாக பார்க்கப்படுவதை வைத்தும் ஆய்வு நடைபெறுகிறது
- இவ்வாய்வில் கலந்து கொள்பவர்களின் சொந்த தகவல்கள் ரகசியமாக பாதுக்காகபடும்
- இந்த ஆய்வின் முடிவுகளை பிரசுரிக்குபோது அல்லது வெளியிடும்போதோ தங்களின் சொந்த தகவல்கள் ஏதும் வெளியிடபடாது

- இந்த ஆய்வில் பங்குபெற அல்லது விலகிக்கொள்ள உங்களுக்கு முழு சுதந்திரம் உண்டு
- இந்த ஆய்வில் இருந்து நீங்கள் விலகிகொண்டாலும் உங்களுக்கு கிடைக்கவேண்டிய சிகிச்சை தொடர்ந்து கிடைக்கும்

ஆராய்ச்சியாளர் கையொப்பம்

பங்கேற்பாளர் கையொப்பம்

நாள்

APPENDIX IV

COPY OF PROFORMA USED

PROFORMA

Name : Booked/UnBooked :

Age:

I P No :

Occupation : D O A :

DOS :

Address : D O D :

Type of surgery: Elective//Emerg

Condition of patient at discharge :

Diagnosis :

PRESENTING COMPLAINTS

Period of Amenorrhea :

Labour Pains : Yes/No

Draining Pervagina : Yes/No

Bleeding Pervagina : Yes/No

Perceiving Fetal Movements : Yes/No

Antenatal checkup : Regular/Irregular

Immunized with inj. TT : Yes/Not

History Suggestive of UTI :

OBSTETRIC HISTORY

History of Consanguineous Marriage : Yes/No

Gravida : Para: Living : Abortion :

HISTORY OF PREVIOUS PREGNANCIES

MENSTRUAL HISTORY :

Age at Menarche :

Previous Menstrual Cycle :

Last Menstrual Period :

Expected date of Delivery :

MEDICAL HISTORY

Diabetes/ GDM : Yes/No Hypertension/ GHT : Yes/No

Tuberculosis :Yes/No Rheumatic Heart Disease :Yes/No

Thyroid disorder:Yes/No Bronchial Asthma : Yes/No

PAST HISTORY

Postpartum Hemorrage : Yes/No

Blood Transfusion : Yes/No

Eclampsia : Yes/No

FAMILY HISTORY

Diabetes: Yes/No Hypertension : Yes/No

Twin Pregnancy : Yes/No Tuberculosis : Yes/No

PERSONAL HISTORY

GENERAL PHYSICAL EXAMINATION

Built : Nourishment :

Pallor : Cyanosis : Icterus: Oedema :

Pulse : Lymphadenopathy :

BP : Breast :

Thyroid :

SYSTEMATIC EXAMINATION

CVS :

RS :

CNS :

Abdominal examination - Height of the Uterus :

Acting/Relaxed :

Lie :

Presentation :

Position :

Fetal Heart Sound :

Vaginal examination :

Cervix - Length :

Dilatation :

Consistency :

Position :

OS :

Membranes :

Vertex - Station :

Pelvis : Adequate/Inadequate

Show : Present/ Not

Liquor draining : Yes /No

Clear/meconium stained

INVESTIGATIONS

Urine - Albumin : Blood groping &typing

Sugar HIV :

Deposits VDRL :

Complete Blood Count: HbsAg :

- Hb gms% -Day of Admission ,3 rd POD
- Total count
- Differential count
- Hcrt
- Platelet count

Bleeding Time: Clotting Time :

RFT: LFT :

U.S.G Obstetrics :

Presentation -

liquor status -

Placental - Site

- Maturity

Fetal heart sound -

Fetal Anomalies -

Estimated foetal weight -

Average Gestational age

Scan EDD :

Diagnosis :

Any induction : Yes / No

Indication for caesarean section :

Time of giving Inj.Tranexamic acid:

Time of incision :

On table findings : Single / Live / Term _____ Baby weight _____ kg at time _____

Placental weight : _____ Liquor : _____

Any on table or postoperative complications :

After delivery of placenta :

Dry Pad weight (A) _____ After soakage weight (B) _____

Blood in suction container in ml (C) :

Total blood loss : (B) – (A) + C = _____

Preop Hb% _____

3 rd POD Hb%_____

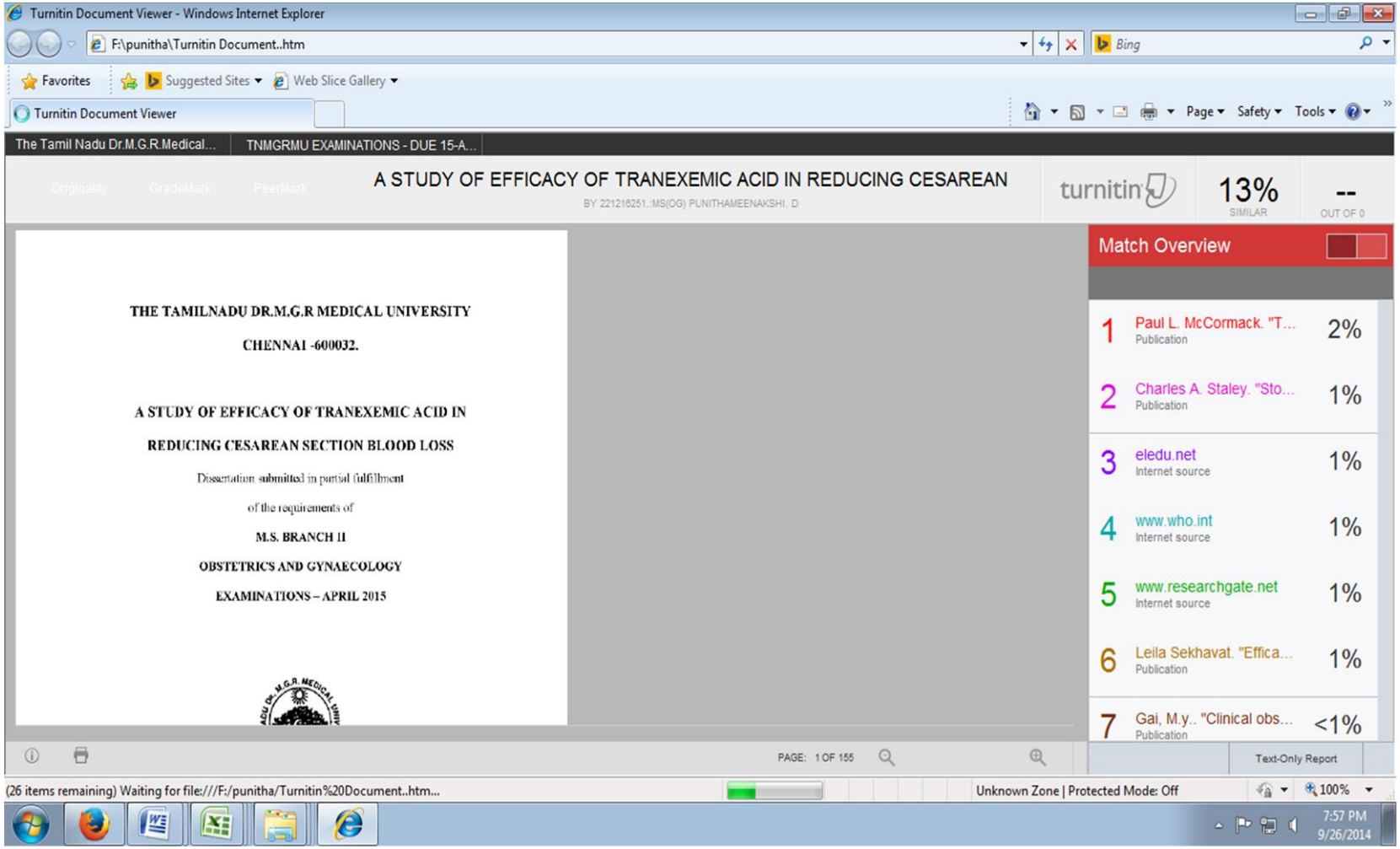
Vitals 2 hours after CS : Systolic BP:

Diastolic BP:

HR :

RR :

PLAGIARISM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Dissertation submitted in partial fulfillment
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APPENDIX V

MASTER CHART-TXA GROUP

S.NO	GROUP	AGE	IP NO	GRAVIDA	SUBJECTIVE CHARACTERS			INDICATION FOR CS	TIME OF GIVING TXA	TIME OF INCISION	BLOOD LOSS (ML)			DURATION OF SURGERY[MIN]	BABY WT (KG)	APGAR[1&5MIN]	VITALS								HB%			ADDITIONAL UTEROTONICS USE	MATERNAL BLOOD TRANSFUSION	MATERNAL COMPLICATIONS	SIDE EFFECTS	NICU ADMISSION	PROLONGED STAY >9POD
																	SYS BP		DIAS BP		HR		RR										
					WEIGHT[KG]	HEIGHT[CM]	BMI				PD – EOS	EOS – 2 hrs PP	TOTAL				BEFORE SURGERY	AFTER SURGERY	BEFORE SURGERY	AFTER SURGERY	BEFORE SURGERY	AFTER SURGERY	BEFORE SURGERY	AFTER SURGERY	ADM HB%	3 POD	FALL IN HB%						
1	A1	23	47603	PRIMI	62	158	25	CPD	11.14PM	11.26PM	300	46	346	40	3	7,8	110	120	70	70	88	86	18	17	11	10	0.6	_	_	_	_	_	_
2	A2	23	47614	PRIMI	58	160	23	FD	11.24PM	11.28PM	260	40	300	42	3	7,8	120	110	80	80	86	83	16	17	10	10	0.8	_	_	_	_	_	_
3	A3	27	47794	PRIMI	58	154	25	FD	11.32PM	11.44PM	310	50	360	40	4	8,9	110	110	80	70	90	92	18	18	11	11	0.4	__	_	_	_	_	_
4	A4	26	47474	PRIMI	54	151	24	Oligo	5.35PM	5.48PM	290	40	330	42	3	8,9	120	110	70	70	88	86	17	17	12	10	1.2	_	_	_	_	_	_
5	A5	20	48121	PRIMI	59	155	25	CPD	4.40AM	4.53AM	250	45	295	43	3	8,9	130	120	80	80	82	84	16	16	11	10	1.2	_	_	_	_	_	_
6	A6	28	48189	PRIMI	61	160	24	CPD	5.12AM	5.37AM	285	44	329	41	3	7,8	120	110	80	80	88	86	17	17	10	10	0.4	_	_	_	_	_	_
7	A7	24	48357	G2P1L1	58	153	25	CPD	12.50AM	1.03AM	750	70	820	43	3	7,8	100	110	80	70	84	90	16	18	11	9	2	Y	Y	PPH	V	_	_
8	A8	22	48657	PRIMI	56	153	24	FD	5.27AM	5.41AM	280	42	322	45	2	8,9	120	120	78	76	82	80	16	16	11	10	0.4	_	_	_	_	_	_
9	A9	25	49374	G2P1L0	60	163	23	CPD	5.50PM	6.02PM	290	44	334	43	4	7,8	120	110	70	70	86	86	17	17	10	10	0.4	_	_	_	_	_	_
10	A10	28	50209	PRIMI	58	156	24	Oligo	10.10AM	10.22AM	250	40	290	47	4	8,9	110	110	80	70	84	82	17	17	10	9	0.2	_	_	_	_	_	_
11	A11	22	57069	PRIMI	61	158	24	FD	4.53PM	5.07PM	280	36	316	46	3	7,8	110	120	70	70	84	82	18	18	10	9	0.8	_	_	_	_	_	_
12	A12	21	50924	PRIMI	58	153	25	FD	5.20PM	5.33PM	240	40	280	42	3	8,9	120	120	80	70	86	84	17	18	10	10	0.4	_	_	_	_	_	_
13	A13	25	57118	PRIMI	57	151	25	Oligo	5.25PM	5.38PM	250	45	295	40	2	7,8	110	110	70	70	86	88	17	17	10	10	0.6	_	_	_	V	Y	_
14	A14	22	48867	PRIMI	58	152	25	Breech	9.34AM	9.50AM	240	50	290	43	3	8,9	120	110	70	80	88	84	16	17	11	10	0.4	_	_	_	_	_	_
15	A15	22	49917	PRIMI	57	160	22	FD	12.14PM	12.27PM	250	45	295	40	3	7,8	100	110	80	70	84	84	17	16	10	10	0.3	_	_	_	_	_	_
16	A16	23	49303	PRIMI	52	151	23	Breech	9.46AM	10.02AM	250	40	290	44	3	8,9	110	110	70	70	86	88	16	17	11	11	0.8	_	_	_	_	_	_
17	A17	26	49815	G2P1L1	62	159	25	CPD	9.53AM	10.08AM	280	45	325	48	3	7,8	120	130	70	76	78	80	17	16	11	10	1	_	_	_	N	_	_
18	A18	20	51235	PRIMI	54	150	24	Breech	6.40PM	6.53PM	250	35	285	44	3	7,8	130	120	80	76	90	88	17	18	10	9	0.4	_	_	_	_	_	_
19	A19	24	51846	PRIMI	59	154	25	CPD	7,17PM	7.26PM	260	32	292	42	3	8,9	110	120	70	80	82	78	18	18	10	9	0.5	_	_	_	_	_	_
20	A20	23	52291	PRIMI	52	154	22	Oligo	5.22PM	5.27PM	255	36	291	45	3	7,8	126	110	76	78	80	76	17	17	10	9	0.6	_	_	_	_	_	_
21	A21	22	52841	G2P1L1	48	150	21	FD	7.03PM	77.17PM	385	65	450	50	3	7,8	116	110	76	70	88	86	18	18	10	10	0.4	Y	_	_	V	_	_
22	A22	22	52739	PRIMI	47	150	21	CPD	6.15PM	6.27PM	290	45	335	46	3	8,9	126	120	78	74	88	90	18	19	11	10	1.2	_	_	_	_	_	_
23	A23	30	52285	G2P1L1	50	148	23	Oligo	12.05PM	12.20PM	265	65	330	50	2	7,8	112	110	76	70	82	90	16	18	11	10	1.6		_		_	Y	Y
24	A24	24	52977	PRIMI	48	147	22	Oligo	11.48PM	12.01AM	285	46	331	46	3	7,8	116	110	82	78	88	90	17	17	10	10	0.6	_	_	_	_	_	_

25	A25	20	52940	PRIMI	54	166	20	FD	2.50AM	3.04AM	275	46	321	40	3	8,9	120	122	78	80	84	80	18	18	10	9	0.4	_	_	_	_	_	_
26	A26	25	569	PRIMI	61	164	23	CPD	6.18PM	6.31PM	265	45	310	41	4	8,9	110	112	80	80	90	92	16	17	10	9	0.6				_		
27	A27	25	1086	PRIMI	65	165	24	CPD	5.22PM	5.36PM	320	50	370	42	4	8,9	124	120	80	70	84	88	17	17	10	9	0.8	_	_	_	_	_	_
28	A28	30	1765	PRIMI	48	148	22	Breech	5.58PM	6.12PM	250	40	290	44	2	7,8	100	100	76	78	88	86	16	16	10	9	0.4	_	_	_	_	_	_
29	A29	21	2238	PRIMI	58	160	23	CPD	5.15PM	5.30PM	250	36	286	40	4	8,9	110	80	78	74	80	82	18	17	10	9	0.6	_	_	_	_	_	_
30	A30	28	260	G2P1L1	63	160	25	CPD	9.30AM	9.41AM	275	34	309	45	3	7,8	120	120	70	80	84	86	16	17	10	9	0.6	_	_	_	_	_	_
31	A31	23	1370	G2P1L1	50	160	20	Breech	11.35AM	11.501M	260	45	305	43	4	7,8	112	110	80	78	82	82	16	16	10	9	0.4	_	_	_	N	_	_
32	A32	23	1886	PRIMI	49	142	24	Breech	10.30AM	10.43AM	250	46	296	40	3	7,8	126	120	80	80	88	86	17	17	10	10	0.4	_	_	_	_	_	_
33	A33	23	2748	PRIMI	58	165	21	FD	4.50PM	5.06PM	240	46	286	45	3	8,9	110	110	70	70	86	84	16	17	11	10	1.2	_	_	_	_	_	_
34	A34	22	2762	PRIMI	57	153	24	Breech	7.54PM	8.06PM	265	35	300	42	3	7,8	120	120	78	76	84	82	17	18	11	11	0.8	_	_	_	_	_	_
35	A35	26	3763	PRIMI	52	153	22	FD	8.40PM	8.54P M	275	35	310	45	3	7,8	100	110	60	70	82	80	16	16	10	9	1.2	_	_	_	_	_	_
36	A36	25	4532	PRIMI	48	151	21	Oligo	3.30pm	3.45pm	265	35	300	44	3	7,8	110	118	76	74	84	86	17	17	10	9	1.2	_	_	_	_	_	_
37	A37	24	5936	G2P1L1	45	153	19	Oligo	9.45AM	10AM	245	43	288	47	3	7,8	110	118	84	84	90	92	16	17	9	9	0.4	_	_	_	_	_	_
38	A38	28	6718	PRIMI	52	162	20	CPD	9.36AM	9.50AM	260	38	298	42	3	8,9	118	116	84	80	78	76	17	16	11	10	0.6	_	_	_	_	_-	_
39	A39	27	3894	PRIMI	62	161	24	FD	5.40PM	5.54PM	245	35	280	47	3	7,8	124	120	76	78	86	82	16	16	11	10	0.8	_	_	_	_	_	_
40	A40	24	3905	PRIMI	61	162	23	Obligue	6.35PM	6.50PM	275	45	320	42	4	7,8	110	110	82	80	76	76	18	17	11	10	0.6	_	_		V	_	_
41	A41	28	3921	G2P1L1	62	160	24	CPD	10.20PM	10.35PM	280	35	315	45	3	7,8	126	124	78	80	88	82	17	18	10	9	0.4	_	_	_	_	_	_
42	A42	20	4018	PRIMI	59	150	26	Oligo	10.33PM	10.48PM	265	40	305	40	3	7,8	110	114	80	78	82	80	16	16	11	10	0.8	_	_	_	_	_	_
43	A43	21	4881	PRIMI	52	157	21	FD	8.12AM	8.26AM	280	35	315	43	3	7,8	120	118	78	76	86	84	17	17	11	10	0.6	_	_	_	_	_	_
44	A44	25	4909	PRIMI	66	164	25	CPD	9.42PM	9.56PM	265	30	295	41	3	7,8	110	110	80	78	82	80	16	16	9	8	0.6	_	_	_	_	_	_
45	A45	27	5549	G2P1L1	44	148	20	Footling	1.40PM	1.55PM	240	45	285	46	4	7,8	124	120	82	80	84	82	18	17	11	10	0.4	_	_	_	_	_	_
46	A46	21	5610	PRIMI	61	165	22	CPD	11.42AM	11.56AM	260	40	300	43	3	8,9	110	110	70	70	76	74	16	17	10	9	0.6	_	_	_	_	_	_
47	A47	20	6167	PRIMI	60	161	23	FD	3.32pm	3.46pm	270	35	305	42	3	7,8	120	110	70	70	78	76	17	17	10	9	0.8	_	_	_	_	_	_
48	A48	25	6184	G2P1L1	53	157	22	FD	4.10PM	4.25PM	260	45	305	44	3	7,8	110	120	78	76	86	84	16	17	10	9	1.2	_	_	_	N	_	_
49	A49	23	6338	PRIMI	58	160	23	Oligo	5.24PM	5.38PM	240	50	290	40	3	8,9	120	120	70	70	80	82	17	17	10	9	0.8	_	_	_	_	_	_
50	A50	23	6247	PRIMI	57	158	23	FD	8.20PM	8.36PM	220	50	270	43	3	7,8	118	120	76	76	86	84	17	17	10	10	0.4	_	_	_	_	_	_
51	A51	30	6341	G2A1	57	159	23	Brow pres	11.19AM	11.37AM	240	35	275	40	3	7,8	110	120	80	70	88	90	16	16	11	10	1	_	_	_	__	_	_
52	A52	27	6594	PRIMI	58	162	22	FD	11PM	11.15PM	275	45	320	43	3	7,8	120	110	76	74	86	86	16	17	11	10	0.8	_	_	_	_	_	_
53	A53	30	6967	PRIMI	58	160	23	CPD	5.07PM	5.24PM	260	50	310	44	3	7,8	126	120	80	80	90	18	18	17	11	10	0.8	_	_	_	_	_	_
54	A54	20	7307	PRIMI	62	162	24	FD	5.56PM	6.12PM	250	50	300	45	3	8,9	120	110	82	80	90	90	18	18	10	9	0.6	_	_	_	_	_	_
55	A55	26	7552	G2P1L1	60	161	23	PL/PROM	6.45PM	7PM	265	45	310	43	3	7,8	130	126	78	80	84	86	17	17	10	9	0.8	_	_	_	_	_	_
56	A56	25	7672	G2P1L0	55	161	21	FD	5.57PM	6.13PM	245	50	295	42	3	7,8	126	120	78	70	88	86	16	16	11	10	0.4	_	_	_	_	_	_
57	A57	23	7797	PRIMI	57	159	23	CPD	6.10PM	6.24PM	280	40	320	40	3	7,8	110	110	80	70	86	80	17	18	11	10	1	_	_	_	N	_	_
58	A58	27	8003	G2P1L1	64	166	23	FD	8.22PM	8.38PM	245	40	285	40	4	7,8	118	112	70	70	84	88	16	16	10	9	1.2	_	_	_	_	_	_
59	A59	22	7930	PRIMI	45	153	19	FD	9.15PM	9.30PM	245	35	280	43	3	7,8	116	110	70	70	76	80	18	17	10	9	0.6	_	_	_	_	_	_
60	A60	26	8025	G2A1	52	157	21	FD	5.32PM	5.50PM	265	35	300	42	3	7,8	110	100	76	70	78	76	17	17	10	9	0.8	_	_	_	_	_	_
61	A61	24	8361	PRIMI	58	160	23	FD	4.28PM	4.42PM	280	30	310	45	28	7,8	120	120	70	70	78	76	16	16	11	10	0.8	_	_	_	_	_	_
62	A62	27	8368	PRIMI	55	161	21	FD	6.35PM	6.52PM	265	50	315	42	3	7,8	124	120	78	80	80	82	18	17	11	10	1	_	_	_	_	_	_

63	A63	23	8335	PRIMI	58	150	26	CPD	4.15PM	4.30PM	250	35	285	43	4	8,9	112	110	70	70	84	86	18	17	10	10	0.8	_	_	_	_	_	_
64	A64	27	8652	PRIMI	53	157	22	Breech	2.35PM	2.50PM	260	35	295	40	2	7,8	116	110	76	76	90	92	16	16	11	10	1.2	_	_	_	_	_	_
65	A65	24	8600	G2P1L1	58	160	23	Breech	6.35PM	6.50PM	275	30	305	42	3	6,7	118	116	76	78	88	84	17	17	10	9	0.4	_	_	_	_	_	_
66	A66	20	8575	G2A1	61	150	27	Oligo	5.40PM	5.56PM	280	40	320	44	3	6,7	118	120	80	80	90	86	18	18	10	9	0.6	_	_	_	_	_	_
67	A67	28	9559	G2P1L1	44	148	20	FD	10.25PM	10.41PM	260	35	295	43	3	7,8	120	118	76	74	76	78	16	17	10	9	0.6	_	_	_	_	_	_
68	A68	23	10441	PRIMI	61	168	22	Breech	10.45PM	11PM	280	50	330	42	3	7,8	110	120	76	76	80	76	17	17	10	9	1	_	_	_	_	_	_
69	A69	23	10750	PRIMI	55	155	23	Oligo	5.40PM	5.56PM	275	45	320	45	3	7,8	110	120	70	72	88	90	16	16	10	9	1.2	_	_	_	_	_	_
70	A70	22	10751	PRIMI	72	168	26	Oligo	4.57PM	5.13PM	270	40	310	41	3	6,7	120	110	80	80	80	86	18	17	9	9	0.4	_	_	_	_	_	_
71	A71	25	11720	PRIMI	62	161	24	FD	5.56PM	6.12PM	275	45	320	40	2	6,7	130	120	78	78	84	86	16	17	10	9	0.4	_	_	_	_	_	_
72	A72	20	12066	PRIMI	67	168	24	FD	7.20PM	7.35PM	350	70	420	43	3	7,8	112	120	70	70	80	84	17	16	11	9	1.8	Y	_	_	V	_	_
73	A73	25	12251	PRIMI	52	162	20	Face	2.45PM	3PM	250	40	290	43	3	7,8	120	110	78	76	76	78	18	17	11	10	0.8	_	_	_	_	_	_
74	A74	22	12390	G2P1L0	70	168	25	Breech	9.20PM	9.35PM	245	40	285	45	3	6,7	100	100	60	60	90	94	17	18	11	10	1.2	_	_	_	_	_	_
75	A75	25	12555	PRIMI	48	150	21	Oligo	5.35PM	5.52PM	240	42	282	40	3	7,8	110	110	70	70	78	76	16	17	12	11	1	_	_	_	_	_	_
76	A76	25	12572	G2P1L1	49	160	19	FD	12.45PM	1PM	250	22	272	41	3	6,7	122	120	76	78	80	82	16	16	10	9	0.6	_	_	_	_	_	_
77	A77	24	12819	G2A1	58	160	23	Oligo	4.25PM	4.41PM	265	45	310	42	3	6,7	132	126	80	78	88	90	17	17	10	10	0.8	_	_	_	_	_	_
78	A78	25	13224	G2P1L1	55	163	21	Face	2.05PM	2.26PM	270	30	300	45	3	7,8	120	120	74	74	74	76	16	16	10	10	0.8	_		_	_	_	_
79	A79	24	13800	PRIMI	60	158	24	FD	5.10PM	5.26PM	300	26	326	45	2	7,8	126	126	74	70	78	78	17	18	11	10	1.2	_	_	_	_	_	_
80	A80	24	16644	PRIMI	64	168	23	FD	3.35PM	3.50PM	245	35	280	43	3	6,7	126	120	70	70	80	76	17	16	10	9	0.4	_	_	_	_	_	_
81	A81	20	16942	PRIMI	48	150	21	CPD	6.05PM	6.20PM	250	30	280	46	4	7,8	130	126	80	78	88	86	18	18	10	10	0.4	_	_	_	_	_	_
82	A82	26	17245	PRIMI	52	166	19	FD	6.05PM	6.24PM	225	35	260	43	3	6,7	114	110	78	80	90	92	18	17	11	11	0.8	_	_	_	N	_	_
83	A83	24	16452	PRIMI	52	159	21	FD	9.15PM	9.40PM	240	36	276	43	3	6,7	116	118	68	70	86	84	17	17	10	10	0.4	_	_	_	_	_	_
84	A84	24	17378	G2P1L1	54	153	23	FD	10.25AM	10.43AM	245	36	281	42	2	7,8	120	120	70	70	90	88	18	17	11	9	0.8	_	_	_	_	_	_
85	A85	27	18202	PRIMI	55	154	23	CPD	4.30PM	4.56PM	250	54	304	44	3	7,8	110	120	70	68	92	94	18	17	10	9	0.6	_	_	_	_	_	_
86	A86	20	18935	PRIMI	60	159	24	FD	5.05PM	5.22PM	245	40	285	43	3	6,7	114	118	78	80	92	96	16	16	10	10	0.4	_	_	_	_	Y	_
87	A87	20	18979	PRIMI	61	162	23	FD	10.15PM	10.32PM	250	28	278	45	3	7,8	120	110	80	80	90	90	17	16	11	10	0.8	_	_	_	_	_	_
88	A88	25	19813	G2P1L1	54	166	20	FD	9.20PM	9.37PM	240	35	275	44	3	7,8	130	120	76	70	82	84	16	17	11	10	0.8	_	_	_	_	_	_
89	A89	27	20171	G2A1	55	159	21,8	CPD	3.15PM	3.30PM	235	35	270	42	3	7,8	116	120	70	70	92	88	17	17	11	11	0.4	_	_	_	_	_	__
90	A90	20	20776	PRIMI	72	166	26	FD	4.10PM	4.25PM	235	44	279	45	3	8,9	118	120	70	72	78	76	17	18	10	9	0.6	_	_	_	_	_	_
91	A91	23	21655	G2P1L1	55	159	22	FD	2.56PM	3.10PM	240	40	280	43	3	7,8	120	118	86	80	92	88	18	17	10	9	0.8	_	_	_	_	_	_
92	A92	21	21637	PRIMI	67	166	24	CPD	7.15PM	7.33PM	250	35	285	43	3	7,8	110	116	80	78	80	82	18	17	10	9	1	_	_	_	D	_	_
93	A93	25	22399	PRIMI	58	159	23	FD	7PM	7.15PM	250	35	285	45	3	6,7	110	110	80	80	84	88	17	16	11	10	1	_	_	_	_	_	_
94	A94	21	22738	G2P1L1	56	166	20	CPD	4PM	4.15PM	245	40	285	46	3	6,7	120	120	76	78	94	96	16	17	11	10	0.6	_	_	_	_	_	__
95	A85	28	21577	PRIMI	64	166	23	FD	10.05PM	10.23PM	230	35	265	42	3	7,8	120	118	84	80	86	84	17	18	10	10	0.6	_	_	_	_	_	_
96	A96	23	23009	PRIMI	54	159	21	FD	6.40PM	6.56PM	250	35	285	50	3	6,7	118	120	76	78	80	82	16	17	11	10	0.8	_	_	_	_	_	_
97	A97	23	24309	PRIMI	58	166	21	FD	4.40PM	4.56PM	245	35	280	40	2	7,8	110	110	70	70	84	86	16	16	10	9	0.8	_	_	_	_	_	_
98	A98	24	24316	PRIMI	60	150	27	FI	3.15PM	3.30PM	230	45	275	41	3	7,8	110	110	82	82	0	88	18	17	10	9	0.6	_	_	_	_	_	_
99	A99	27	24309	PRIMI	60	153	26	FI	7.32PM	7.48PM	240	30	270	41	3	6,7	120	110	78	80	94	96	17	17	10	9	1.2	_	_	_	_	_	_
100	A100	22	24507	PRIMI	60	152	26	FI	8PM	8.17PM	250	35	285	40	3	7,8	126	124	70	70	90	92	17	18	10	9	0.8	_	_	_	_	_	_

APPENDIX VI

MASTER CHART

MASTER CHART-CONTROL GROUP

S.NO	GROUP	AGE	IP NO	GRAVIDA	SUBJECTIVE CHARACTERS			INDICATION FOR CS	TIME OF GIVING TXA	TIME OF INCISION	BLOOD LOSS (ML)			DURATION OF SURGERY[min]	BABY WT (KG)	APGAR[1&5 min]	VITALS								HB% [gms%]			ADDITIONAL UTER	MATERNAL BLOOD TRANSFUSION	PPH	MATERNAL COMPLICATIONS	NICU ADMISSION	PROLONGED STAY >9POD
																	SYS BP		DIAS BP		HR		RR										
					WEIGHT[kg]	HEIGHT[cm]	BMI				PD – EOS	EOS – 2 hrs PP	TOTAL				BEFORE SURGERY	AFTER SURGERY	BEFORE SURGERY	AFTER SURGERY	BEFORE SURGERY	AFTER SURGERY	BEFORE SURGERY	AFTER SURGERY	ADM HB%	3 POD	FALL IN HB%						
101	B1	23	47609	PRIMI	60	158	24	CPD	_	11.55AM	320	60	380	43	3.5	7,8	110	112	78	76	90	92	17	17	11	10	1	_	_	_	_	_	_
102	B2	30	47786	PRIMI	56	150	24.9	Precious	_	10.26PM	340	60	400	40	2.7	7,8	120	120	80	78	86	88	16	17	12	10	1.6	_	_	_	_	_	_
103	B3	22	47474	PRIMI	57	165	20.9	Breech	_	12.02PM	370	70	440	45	3.5	6,7	110	110	70	70	88	86	18	17	10	9	1.2	_	_	_	_	_	_
104	B4	30	48156	PRIMI	56	152	24.2	Precious	_	6.25PM	360	60	420	45	3	7,8	120	118	76	78	86	86	17	17	10	9	0.8	_	_	_	_	_	_
105	B5	23	48275	PRIMI	60	162	22.9	OLIGO	_	11.02PM	350	60	410	44	3.6	7,8	110	110	78	76	80	86	17	18	9	9	0.6	_	_	_	V	_	_
106	B6	24	48353	PRIMI	48	140	24.5	FD	_	1AM	360	40	400	41	3.7	6,7	130	126	80	78	78	76	17	17	11	9	1.2	_	_	_	_	_	_
107	B7	23	48806	PRIMI	60	150	26.7	Breech	_	7PM	340	70	410	45	3.2	6,7	124	120	80	80	86	90	18	18	11	11	0.8	_	_	_	_	_	_
108	B8	21	48650	PRIMI	54	153	23.1	FD	_	11.50PM	700	120	820	50	3.3	6,7	110	100	84	80	76	80	17	17	11	9	2	Y	Y	Y	_	_	_
109	B9	20	49316	PRIMI	61	162	23.2	Breech	_	6.42PM	380	60	440	46	2.5	7,8	120	110	80	80	78	80	17	18	12	11	1	_	_	_	_	_	_
110	B10	28	49500	PRIMI	48	153	20.5	Breech	_	12.05PM	360	80	440	40	2.3	7,8	110	112	78	78	88	90	16	16	12	10	1.2	_	_	_	_	_	_
111	B11	27	50926	PRIMI	62	158	24.8	FD	_	12.25PM	380	80	460	40	3	7,8	110	110	86	84	90	92	16	17	11	9	1.6	_	_	_	_	_	_
112	B12	23	51175	PRIMI	58	146	27.2	FD	_	6PM	370	75	445	38	2.6	6,7	114	120	86	80	84	80	17	17	10	10	0.4	_	_	_	_	_	_
113	B13	27	48173	G2P1L1	63	150	28	FD	_	11.48AM	360	80	440	42	2.8	6,7	110	110	80	80	88	84	16	18	10	9	0.8	_	_	_	N	Y	_
114	B14	24	49230	G2P1L1	58	161	22.4	CPD	_	10.35AM	350	80	430	45	3.2	6,7	120	116	70	70	84	88	17	16	9	9	0.4	_	_	_	_	_	_
115	B15	23	49266	G2P1L1	61	150	27.1	CPD	_	10.54AM	365	85	450	44	3.5	7,8	124	120	70	74	76	80	18	17	10	9	0.8	_	_	_	_	_	_
116	B16	25	49775	G2P1L1	48	150	21.3	CPD	_	11.40AM	370	70	440	42	3	6,7	110	114	84	82	80	80	16	16	11	10	1.2	_	_	_	_	_	_

117	B17	27	50582	PRIMI	56	157	22.7	CPD	_	10.06AM	375	90	465	41	3.2	6,7	120	110	82	80	78	76	17	17	12	10	1.6	_	_	_	_	_	_
118	B18	24	51457	PRIMI	53	153	22.6	Breech	_	9.47AM	370	70	440	44	3.2	7,8	120	118	80	82	76	80	18	17	11	10	1	_	_	_	_	_	_
119	B19	23	51846	G2A1	60	161	23.1	CPD	_	10.40AM	365	105	470	43	4.1	7,8	110	110	70	70	88	90	17	17	11	10	1	_	_	_	_	_	_
120	B20	27	50097	PRIMI	48	152	20.8	OLIGO	_	5.45PM	345	80	425	40	3	7,8	110	114	70	70	84	84	16	17	10	9	0.6	_	_	_	_	_	_
121	B21	21	51931	PRIMI	56	151	24.6	CPD	_	10.33AM	380	100	480	42	3.2	8,9	116	116	74	76	88	86	17	17	11	10	1.4	Y	_	_	V	_	_
122	B22	20	52057	PRIMI	52	154	21.9	FD	_	11AM	360	85	445	38	2.8	7,8	128	130	76	78	80	84	16	16	11	10	0.8	_	_	_	_	_	_
123	B23	26	52551	PRIMI	51	153	21.8	FD	_	12.05PM	360	90	450	40	2.8	6,7	110	110	80	76	82	80	18	18	9	9	0.4	_	_	_	_	_	_
124	B24	24	52197	PRIMI	62	150	27.6	FD	_	3AM	390	90	480	42	3.2	6,7	126	122	84	86	78	78	16	17	10	8	1.2	_	_	_	_	_	_
125	B25	21	52940	PRIMI	54	153	23.1	FD	_	8.05A M	375	85	460	38	3.1	6,7	130	122	78	76	82	84	17	17	11	11	0.6	_	_	_	_	_	_
126	B26	30	131	G2P1L1	58	162	22.1	PL/PROM	_	5.45AM	360	70	430	48	2.8	6,7	120	126	78	78	78	80	18	17	11	10	1.2	_	_	_	_	_	_
127	B27	24	575	PRIMI	55	143	26.9	CPD	_	7.05PM	430	75	505	42	3.5	6,7	120	116	74	74	80	80	17	18	11	9	1.8	Y	_	Y	_	_	Y
128	B28	23	1052	PRIMI	55	155	22.9	FD	_	12.45PM	370	80	450	43	3.5	7,8	110	110	78	76	92	90	18	18	12	10	1.6	_	_	_	_	_	_
129	B29	28	2249	PRIMI	55	153	23.5	FD	_	7.20PM	350	80	430	45	2.9	7,8	110	110	70	70	86	86	17	17	10	9	0.6	_	_	_	_	_	_
130	B30	25	4111	G2P1L1	64	150	28.4	CPD	_	10AM	370	95	465	45	3	7,8	120	122	78	80	80	78	16	16	11	10	0.8	_	_	_	_	_	_
131	B31	29	1462	G2P1L1	48	149	21.6	FD	_	11.15AM	360	90	450	38	2.8	7,8	116	118	80	86	86	80	16	16	11	10	0.8	_	_	_	_	_	_
132	B32	28	2076	G2P1L1	58	162	22.1	PL/PROM	_	10.15AM	365	90	455	46	2.7	6,7	120	126	86	90	80	80	17	17	11	10	1.2	_	_	_	_	_	_
133	B33	23	3256	PRIMI	48	141	24.1	FD	_	9.30AM	360	85	445	44	2.5	6,7	130	120	78	84	86	84	17	18	2	10	1.2	_	_	_	_	_	_
134	B34	23	3289	G2P1L1	60	162	22.9	FD	_	12.32PM	375	80	455	45	3	6,7	120	116	80	80	80	82	17	17	10	9	0.8	_	_	_	_	_	_
135	B35	24	3166	PRIMI	58	168	20.5	OLIGO	_	8.05PM	360	70	430	43	2.2	5,6	120	110	78	76	78	80	17	16	10	9	1.2	_	_	_	_	Y	Y
136	B36	25	3303	G2A1	57	161	22	FD	_	11.50AM	370	85	455	46	3.3	6,7	110	110	80	82	80	88	17	17	11	9	1.2	_	_	_	_	_	_
137	B37	30	5192	G2P1L1	56	168	19.8	PL/CPD	_	10.45AM	360	70	430	48	3.2	6,7	120	120	70	70	76	78	17	17	11	10	1.2	_	_	_	_	_	_
138	B38	24	5228	G2P1L1	63	160	24.6	PL/CPD	_	10.15AM	360	90	450	49	3.5	6,7	110	110	78	76	80	84	16	16	10	9	0.8	_	_	_	_	_	_
139	B39	24	4016	PRIMI	69	148	31.5	FD	_	9.45PM	370	80	450	42	3.6	7,8	110	110	76	78	80	76	17	18	10	9	1	_	_	_	_	_	_
140	B40	24	4120	G2P1L1	40	135	21.9	PL/PROM	_	6.35AM	360	80	440	41	2.8	7,8	126	120	78	78	78	80	16	16	12	11	0.6	_	_	_	_	_	_
141	B41	27	4289	PRIMI	44	148	20.1	FD	_	12.45AM	350	70	420	40	3.3	7,8	120	110	80	80	78	78	17	17	11	9	1.2	_	_	_	_	_	_

142	B42	21	4954	PRIMI	63	152	27.3	FD	_	6.40AM	370	90	460	43	3.2	6,7	120	118	78	80	90	92	18	17	10	9	0.6	_	_	_	_	_	_
143	B43	27	4989	G2P1L1	55	168	19.1	FD	_	6AM	740	80	820	43	3.6	6,7	114	116	76	78	90	94	18	17	11	9	1.6	Y	Y	Y	_	_	_
144	B44	21	5773	PRIMI	53	157	21.5	FD	_	1AM	310	70	380	45	2.4	6,7	120	122	80	80	88	86	17	17	11	10	0.8	_	_	_	_	_	_
145	B45	24	5797	G2P1L1	54	167	19.4	PL/CPD	_	10.20AM	350	85	435	40	3.5	6,7	124	120	78	80	80	84	16	17	11	10	0.6	_	_	_	_	_	_
146	B46	22	6186	PRIMI	40	140	20.4	CPD	_	3.35PM	370	95	465	44	3.4	7,8	116	120	80	80	84	82	16	17	12	11	1.2	_	_	_	_	_	_
147	B47	24	6260	G2P1L0	60	161	23.1	Breech	_	9.50AM	365	80	445	43	3	6,7	120	118	78	80	80	78	17	17	12	10	0.6	_	_	_	_	_	_
148	B48	30	6338	PRIMI	54	166	19.6	FD	_	7.56PM	365	70	435	41	2.6	6,7	118	120	78	70	78	80	17	18	10	9	1.2	_	_	_	_	_	_
149	B49	24	10373	G2P1L1	48	150	21.3	FD	_	12.45AM	360	70	430	42	2.8	7,8	106	100	76	78	86	82	18	18	11	9	1.2	_	_	_	_	_	_
150	B50	21	6997	PRIMI	61	164	22.7	Breech	_	5.55PM	370	65	435	36	2.8	7,8	120	122	78	80	80	80	17	18	10	9	1	_	_	_	_	_	_
151	B51	24	7292	PRIMI	46	148	21	FD	_	12.25PM	370	70	440	46	2.8	8,9	118	120	78	80	78	80	17	17	12	10	1.2	_	_	_	_	_	_
152	B52	20	7380	PRIMI	55	155	22.9	CPD	_	11.50AM	375	70	445	44	3.5	7,8	120	122	86	80	76	76	16	16	11	9	1.2	_	_	_		_	
153	B53	21	7711	PRIMI	59	149	26.6	FD	_	1.221M	375	80	455	36	2.2	7,8	116	110	88	84	80	80	17	17	9	8	1.4	_	_	_	_	_	_
154	B54	24	7696	G2P1L1	70	152	30.3	FD	_	6.25PM	350	70	420	40	2.3	7,8	110	110	70	70	82	80	16	16	12	11	0.8	_	_	_	_	_	_
155	B55	24	8165	G2P1L1	59	148	26.9	Breech	_	10AM	360	95	455	42	1.7	7,8	120	110	80	80	86	88	17	18	12	10	1.2	_	_	_	_	Y	Y
156	B56	25	8181	PRIMI	62	165	22.8	FD		10.35AM	360	70	430	46	2.8	7,8	130	128	80	70	90	78	18	18	10	9	1	_	_	_	_	_	_
157	B57	27	8270	G2A1	58	148	26.5	FD	_	12.05PM	355	70	425	45	3	6,7	110	120	86	70	78	80	17	18	9	9	0.4	_	_	_	_	_	_
158	B58	21	8366	PRIMI	57	148	26	FD	_	6.55PM	375	70	445	42	3.7	7,8	120	110	70	70	84	88	17	17	9	9	0.6	_	_	_	V	_	_
159	B59	28	8963	PRIMI	58	160	20.7	FI	_	7.12PM	380	55	435	43	2.3	7,8	110	110	76	74	90	90	18	17	11	10	0.8	_	_	_	_	_	_
160	B60	30	9393	G2P1L1	56	148	25.6	Breech	_	6.13PM	680	60	740	45	3	7,8	116	120	78	80	84	82	18	18	11	9	1.8	Y	Y	Y	_	_	_
161	B61	24	9348	PRIMI	40	138	21	CPD	_	6.50AM	370	60	430	45	3.7	7,8	100	112	70	70	78	78	17	18	12	11	1	_	_	_	_	_	_
162	B62	24	9683	PRIMI	61	162	23.2	FD	_	12.05AM	365	75	440	46	2.8	7,8	110	100	80	80	86	84	17	17	10	9	1.2	_	_	_	_	_	_
163	B63	23	10440	PRIMI	48	146	22.5	FD	_	12.20AM	350	75	425	42	3.5	7,8	120	110	76	70	88	84	18	18	13	11	1.2	_	_	_	_	_	_
164	B64	25	11688	PRIMI	67	153	28,6	FD	_	6.35PM	370	50	420	42	2.9	7,8	108	100	78	80	76	78	16	16	11	11	0.8	_	_	_	_	_	_
165	B65	22	11435	PRIMI	63	160	24.6	Breech	_	11.25AM	360	65	425	40	2.8	6,7	100	90	70	70	80	80	17	17	10	9	0.8	_	_	_	_	_	_
166	B66	23	12186	PRIMI	48	143	23.5	FD	_	11.25AM	375	75	450	44	2.5	8,9	130	120	80	84	76	76	16	16	9	9	0.4	_	_	_	_	_	_

167	B67	26	12466	G2P1L0	65	153	27.8	OLIGO	_	5.23PM	355	70	425	43	3.3	7,8	110	116	76	76	80	76	16	17	12	11	1.2	_	_	_	_	_	_
168	B68	26	12209	G2P1L1	63	166	22.9	FD	_	11.23AM	370	70	440	45	2.7	7,8	110	100	86	84	78	78	18	18	10	9	0.8	_	_	_	_	_	_
169	B69	24	12583	PRIMI	56	158	22.4	OLIGO	_	5.52PM	365	85	450	46	2.6	7,8	100	110	88	90	80	82	18	17	12	12	0.8	_	_	_	_	_	_
170	B70	26	12802	G2A1	63	158	22.2	OLIGO	_	12.15PM	365	65	430	40	3.8	7,8	110	110	78	80	82	80	17	17	11	10	0.6	_	_	_	_	_	_
171	B71	24	13013	G2A1	63	153	26.9	FD	_	4.10PM	355	70	425	42	3.3	6,7	130	126	80	70	94	92	17	18	11	11	0.8	_	_	_	_	_	_
172	B72	27	13808	PRIMI	62	160	24.2	CPD	_	7PM	370	80	450	43	3.2	8,9	136	128	86	80	90	90	19	18	11	10	0.6	_			_	_	_
173	B73	20	14494	PRIMI	63	159	24.9	FD	_	3.52PM	375	90	465	44	3.5	7,8	128	122	86	80	90	94	17	18	11	10	1.2	_	_	_	_	_	_
174	B74	25	14281	PRIMI	61	153	26.1	OLIGO	_	5.46PM	400	70	470	46	2.9	8,9	110	110	70	70	78	74	18	18	12	10	1.4	Y	_	Y	V	_	_
175	B75	21	16464	PRIMI	61	162	23.2	FD	_	7.26AM	375	75	450	43	3.3	7,8	120	120	70	70	86	90	19	18	10	10	0.8	_	_	_	_	_	_
176	B76	27	16487	G2P1L1	58	153	24.8	OLIGO	_	11.15PM	360	70	430	42	2.8	7,8	100	100	76	70	76	76	18	17	10	9	0.6	_	_	_	_	_	_
177	B77	21	16744	PRIMI	68	166	24.7	FD	_	4PM	365	65	430	42	2.8	7,8	120	110	80	80	78	76	18	18	12	12	0.6	_	_	_	_	_	_
178	B78	23	17202	PRIMI	60	146	28.1	CPD	_	5.45PM	385	60	445	43	3	7,8	116	118	74	76	76	80	17	17	10	8	1.2	_	_	_	_	_	_
179	B79	28	17529	G2P1L1	57	161	22	FD	_	11.55AM	355	80	435	40	2.4	6,7	130	130	78	70	70	70	17	18	11	10	0.8	_	_	_	_	_	_
180	B80	26	18015	PRIMI	58	147	26.8	FD	_	2.33PM	360	80	440	41	2.4	6,7	120	120	70	70	86	84	18	18	11	10	1.2	_	_	_	_	_	_
181	B81	21	17983	PRIMI	51	162	19.4	FI	_	10.35PM	375	65	440	40	2.9	7,8	100	100	70	60	84	88	16	17	10	9	0.6	_	_	_	_	_	_
182	B82	23	18153	PRIMI	57	161	22	FD	_	11.03AM	700	60	760	43	3	7,8	120	110	80	80	90	90	16	16	11	9	2.2	Y	Y	Y	_	_	_
183	B83	25	18520	PRIMI	60	148	27.4	FD	_	1.06PM	365	55	420	42	2.8	7,8	124	120	78	80	82	80	17	18	10	9	1.2	_	_	_	_	_	_
184	B84	21	18806	PRIMI	65	165	23.9	FD	_	1.27PM	360	80	440	40	2.6	6,7	116	118	76	78	88	86	16	17	11	10	1	_	_	_	_	_	_
185	B85	26	19815	G2P1L1	61	146	28.6	FD	_	5.45PM	350	65	415	40	2.8	6,7	100	100	80	80	80	82	17	17	10	9	0.6	_	_	_	_	_	_
186	B86	25	19817	PRIMI	58	148	26.5	FI	_	10.07PM	365	85	450	43	3.5	6,7	110	100	80	70	88	84	17	18	10	9	1.2	_	_	_	_	_	_
187	B87	28	20201	G2P1L1	48	166	17.4	PL/PROM	_	1.13PM	360	55	415	42	2.6	6,7	120	120	78	80	80	78	16	16	10	9	0.6	_	_	_	_	_	_
188	B88	22	20038	PRIMI	55	141	27.7	FD	_	6.56PM	350	50	400	41	3.1	7,8	118	120	80	78	80	80	17	17	11	10	0.8	_	_	_	_	_	_
189	B89	23	20356	PRIMI	52	143	25	CPD	_	5.46PM	360	45	405	44	3.3	7,8	100	70	80	60	78	78	16	16	10	9	1	_	_	_	_	_	
190	B90	26	21448	PRIMI	56	158	22.4	FD	_	7.55PM	355	70	425	43	3	6,7	130	120	80	70	78	80	17	17	12	11	0.8	_	_	_	_	_	_
191	B91	23	21636	PRIMI	55	144	26.5	FD	_	10.52PM	360	55	415	42	3.2	6,7	124	120	86	88	84	84	18	17	10	9	0.8	_	_	_	_	_	_

192	B92	30	21750	G2P1L1	68	156	27.9	PL/CPD	_	10.25AM	360	75	435	42	2.9	6,7	110	120	80	86	90	90	17	18	10	9	1	_	_	_	_	_	_
193	B93	26	22399	G2P1L1	55	148	25.1	PL/PROM	_	12.55PM	375	50	425	44	2.3	7,8	120	110	70	70	84	82	17	17	12	11	1.2	_	_	_	_	Y	_
194	B94	21	22738	PRIMI	58	146	27.2	FD	_	11.32AM	360	40	400	41	3	6,7	130	126	78	80	82	80	17	17	10	10	0.8	_	_	_	_	_	_
195	B95	22	23154	G2P1L1	54	145	25.7	CPD	_	2.13PM	690	165	855	41	3	7,8	100	110	80	80	86	86	16	17	11	9	2.4	Y	Y	Y		_	Y
196	B96	24	23745	PRIMI	58	160	20.7	FI	_	10.05PM	380	55	435	40	3.2	7,8	110	110	70	70	84	88	18	17	11	10	0.8	_	_	_	_	_	_
197	B97	25	24122	G2P1L1	67	145	31.9	FD	_	7.34PM	365	50	415	40	3	7,8	120	120	80	70	88	88	17	17	10	9	0.6	_	_	_	_	_	_
198	B98	22	24157	G2P1L1	63	156	25.9	PL/PROM	_	6.30PM	320	45	365	41	2.5	6,7	110	120	78	80	76	78	16	16	10	9	1.2	_	_	_	_	_	_
199	B99	27	24440	PRIMI	55	146	25.8	OLIGO	_	6.24PM	380	60	440	41	3	6,7	100	100	70	60	80	82	18	17	10	9	1	_	_	_	_	_	_
200	B100	27	24512	PRIMI	61	148	27.8	FD	_	5PM	360	65	425	43	2.7	7,8	110	110	80	80	78	80	17	18	10	9	0.8	_	_	_	_	_	_

Note:

Y-Yes

N-Nausea

V-Vomiting

D-Diarrhea